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MR. G. W. MAYNARD leaves for Colorado, Utah, and Nevada in a few days. All information as to his movements may be obtained at his office, 24 Cliff street, this city.

M. H. BOUILHET, who is connected with the famous Paris jewelry firm CHRISTOFLE, estimates that annually 125,000 kilograms, or nearly 4,020,000 ounces, of silver are annually used for electro-plating in Europe and America.

THE steel bloom question has again come up before the Treasury Department, and the elaborate argument made by Secretary Folger on the questions involved furnishes another striking example of the inability of such officials to cope with matters of technical detail.

THE Bureau of Statistics reports that, for the month ended January 31st of the present year, there was an excess of exports of gold and silver coin and bullion over imports of $617,290. During the corresponding period a year ago, there was an excess of imports of $4,282,943.

A COMMITTEE of the Anglo-American Club, of Freiberg, Germany, an association composed of students attending the School of Mines in that city, has issued a circular asking mining engineers to forward to the Club copies of papers and reports published by them, as they will prove of great assistance to the students.

WE print elsewhere a summary of a report by Prof. W. P. BLAKE on the Alice mine, of Butte, Montana. Mr. BLAKE's report is elaborate and exhaustive, and is supplementary to that made a little more than a year ago, and even to those who are not directly interested in the property a perusal will prove profitable and suggestive.

CRUSHED coke is becoming a favorite household fuel in the West, being manufactured on a large scale in the vicinity of Latrobe, Pa., where the works can not keep pace with the demand. Could not those of our gas-works which find it difficult to get rid of their coke to best advantage enlarge their market by paying more attention to its preparation in a similar way?

IN his annual report, Inspector of Mines BROWN, of Maryland, urges that the time is rapidly approaching when the veins which lie below the Big Seam in the George's Creek District must be developed. Only one mine is now working in one of these seams, and it is held that the quality of the coal is not inferior to that in the Clearfield and Snow-Shoe districts, Pennsylvania.

WE notice with satisfaction that a "Colorado Institute of Engineers" has been organized by the civil, mining, and mechanical engineers, chemists, and metallurgists of Leadville. There is a large field for such societies, and they are capable of doing much good work. We trust that this one, which we believe is the first in Colorado, will, under efficient management and active support, soon accomplish its purpose, and become a model for kindred organizations in other parts of the West.

DURING the present session of Congress, four bills have been brought before the House of Representatives, all having the object of enlarging the powers and duties of the Department of Agriculture. They were duly referred to the Committee on Agriculture, which, on February 13th, reported a bill as a substitute for them. It provides for the establishment of a new executive department under the supervision and control of a Secretary of Agriculture, and for the organization of Bureaus of "Agricultural Products," "Animal Industry," "Lands," and "Statistics." Of the general features of the bill we have nothing to say. We would, however, in the interests of science and the mining industries of the country, protest emphatically against one of its provisions. We need only state the objectionable paragraph to enlist the opposition of all those who appreciate how effective is the organization and how able the work of the Geological Survey as now constituted:

"Third. The Bureau of Lands, the chief of which shall investigate and report upon the resources or capabilities of the public or other lands for farming, stock-raising, timber, manufacturing, mining, or other industrial uses. And all powers and duties vested in the commission now known as the Geological Survey, together with all clerks, employés, and agents, and all instruments, records, books, papers, and so forth, are hereby transferred to the Department of Agriculture. And the secretary may, through said bureau, institute such investigations and collect such information, facts, and statistics relative to the mines and mining of the United States as may be deemed of value and importance."

AMONG the many tributes to HOLLEY'S genius and virtues, one of the most cordial and appreciative is that of London *Engineering*, in which we think we recognize the hand of his friend, Mr. DREDGE. The most serious omission in that article is due to the suppression by Mr. DREDGE of all mention of his own devoted care and attention during HOLLEY'S almost fatal illness at London, in 1880. We have heard the story, partly from our departed friend's own lips, partly from those of Mr. LENOX SMITH, who was his traveling companion at that time. It was with difficulty, after a desperate illness in Germany, that HOLLEY was got safely back to London lodgings ; and it seemed likely that he was doomed to suffer long, perhaps to die, under circumstances of relative loneliness and discomfort. Yet it would have been impossible to persuade him to throw himself as a burden upon any of his friends in England, though more than one was ready to receive him. Invitations to visit in the country he declined. At last, by a friendly stratagem, Mr. DREDGE decoyed him, under pretense of a pleasure-drive, to his own villa at Clapham, sent to the London lodgings for his baggage, captured him, kept him, and, as HOLLEY used to say, "pulled him through." He never afterward ceased to declare that to Mr. DREDGE and the members of his household he owed his life. True, it was prolonged but a few months; but they were so fruitful, and to many hearts so precious, that a public expression of gratitude for the devoted friendship which secured this blessing seems to us an imperative duty.

THE statistics just issued covering the year 1881 are full of interest and deserve close study, though they are received at so late a period that

they have more a historical value than any direct influence in shaping current commercial transactions. Iron and steel, of course, take the lead in importance. The figures we give below are net imports, and are arrived at by deducting from the imports the quantities of foreign iron and steel returned as re-exported. As they are on the whole small only, we have not thought it worth while to present both sets of figures separately.

IRON AND STEEL.	1881. Tons.	1880. Tons.
Pig-iron and castings	517,155	781,509
Bar and boiler iron	47,216	126,534
Band, hoop, and scroll iron	818	25,156
Sheet-iron	8,060	11,338
Old and scrap	134,917	619,887
Anchors, chains, and cables	1,453	1,332
Iron rails	136,648	139,069
Steel rails	240,741	157,822
Steel ingots, bars, and wire	$9,923,566	$5,569,097

The total imports of iron and steel, cutlery, machinery, fire-arms, tools, saws, hardware, and other manufactures footed up in value to $46,668,171 in 1881, against $63,963,252 in 1880. Deducting from these figures the amounts of foreign merchandise re-exported, we reach the following total of the net imports of iron and steel during 1881 and 1880: $45,851,174 and $63,444,675.

It will be noticed that there is quite a falling off in pig and bar, but particularly in old iron and scrap, for which the whole world was ran, sacked during the boom to cover the demand of speculators here. The drop in band, hoop, and scroll is due to the uncertainty of the Treasury rulings on the duty on cotton ties, cut to lengths and punched. There is a striking increase in the receipts of steel rails and in "steel ingots, bars, and wire," for which the Bureau of Statistics returns values only. It is almost exclusively due to the imports of steel blooms for rolling rails. The following were the stocks held in bonded warehouses at the close of 1880 and 1881:

	1881. Tons.	1880. Tons.
Pig-iron	11,147	184,134
Bar, band, hoop, and scroll	6,036	21,850
Sheet-iron	1,302	2,545
Old and scrap	8,772	172,510
Iron rails	5,705	39,912
Steel rails	11,402	38,379

These figures clearly show that much of the iron and steel imported during the year 1880 really entered into consumption only during 1881, and that stocks of foreign material in bonded warehouses are now so small, comparatively, as to be of little account so far as the markets are concerned.

In metals, the movement was as follows, in tons of 2000 pounds:

	Imports.		Re-exports. Foreign.		Exports. Domestic.		Excess of imports over exports.	
	1881.	1880.	1881.	1880.	1881.	1880.	1881.	1880.
Tin	9,168	13,346	1,292	420	.....	.....	7,876	12,926
Copper	395	2,281	126	377	3,517	163	.....	1,741
Lead	3,935	3,219	481	21	.....	.....	3,454	3,198
Spelter	2,756	3,080	.....	....	691	869	2,065	2,211
Sheet-zinc	1,338	2,144	14	37	.....	.....	1,324	2,107

While in 1880 the imports of copper exceeded the exports by 1741 tons, they were 3251 tons less in 1881.

It will be noted that there was a very great falling off in the receipts of tin, which has contributed much toward placing that metal in the strong position in which it now is.

The chemical industries are so closely allied to mining and metallurgical operations elsewhere, and will in the future become so in this country also, that a brief summary of the statistics is valuable and suggestive. The imports were:

	1881.	1880.
Chloride of lime	43,476	35,024
Gypsum	120,467	137,826
Nitrate of soda	63,307	38,536
Crude sulphur	117,392	92,180
Argols	7,858	6,942
Salt	506,498	509,703
Nitrate of potash	6,521	6,381
Bicarbonate of soda	896	3,858
Carbonate, including sal soda and soda ash	143,758	153,533
Caustic soda	25,250	22,608
Acetate, sulphate, and all other salts of soda, not elsewhere specified	1,602	364

In conclusion, we may give the following general summary, which shows what the general result of our commerce with foreign countries was:

Merchandise.

	Domestic exports.	Foreign exports.	Imports.	Excess of exports.
1880	$875,564,075	$14,119,347	$696,807,176	$192,876,246
1881	814,161,573	19,386,150	670,199,654	163,248,069

Gold and Silver Coin and Bullion.

	Domestic exports.	Foreign exports.	Imports.	Excess of imports
1880	$8,415,902	$7,629,999	$85,275,723	$49,229,822
1881	15,103,177	4,563,640	68,994,265	49,327,448

Merchandise and Coin and Bullion.

	Domestic exports.	Foreign exports.	Imports.	Excess of exports.
1880	$883,979,977	$21,749,346	$782,082,899	$123,646,424
1881	829,264,750	23,949,790	739,193,919	114,020,621

According to these figures, the balance of trade was in our favor to the extent of $237,667,065 in two years, a fact over which so many profess to rejoice.

WELL DONE.

At its meeting on Wednesday, March 1st, the Bessemer Association decided to purchase at once from the family of ALEXANDER L. HOLLEY his patent for a removable converter-shell, paying therefor the sum of fifty thousand dollars. The generous promptness of this action deserves unstinted praise. It is no secret that before HOLLEY'S death the patent referred to had been the subject of negotiation, involving some degree of controversy and even of misunderstanding, between him and the Bessemer companies. Some of the leading representatives of the latter, in defense of what they deemed their business rights and interests, opposed the purchase, or insisted upon more favorable terms. The matter is now past, and we recall it, only to enhance the credit due to those gentlemen who, notwithstanding the natural impulse to maintain a position once asserted, have yielded to a higher impulse, and heartily joined with their associates to do a wise thing in a handsome way.

That the thing itself, apart from the generous manner of the doing of it, was a wise business transaction, we have no doubt. The best Bessemer engineers are convinced of the great value of the invention. HOLLEY himself considered it to be the crowning triumph of his career, and the best legacy he could leave to his profession. In all Bessemer practice, and especially in that of the basic process, the time consumed in the renewal of converter-linings has always been a great element of cost and the chief hinderance to the increase of product from a given plant. So far as the converter-bottom was concerned, the difficulty was long ago removed by an invention of HOLLEY'S, of which the removable shell is in some sense a logical sequence. When this shall have been added to the Bessemer plant, it is difficult to see how any further important increase of productive capacity is to be secured. The maximum will appear to have been reached.

We can not forbear to quote in this connection, from the unrevised stenographer's notes in our possession, some remarks made by Hon. A. S. HEWITT, at the recent memorial session of the Institute of Mining Engineers. The proceedings of that session will be hereafter published in permanent form; and we do not purpose to give them now. But we forestall the official report of this one passage. Mr. HEWITT had already spoken of HOLLEY'S life and character as known to him by long acquaintance, and had been followed by other speakers, when, on hearing the remarks of ROBERT W. HUNT, of Troy, including an allusion to the invention of the remarkable converter-bottom, he again rose, and spoke as follows:

"I beg pardon for interrupting, but I shall be condemned by all of you if I do not relate an incident that happened in London at the time Holley was sick. Reference has been made to the movable shell, his patent, which, as I understand, is necessary to the success of the basic process in America. While in Europe in 1880, in the fall of the year, I was astonished and pained to hear that Holley was dying in London. I immediately went to Clapham, where he was said to be, to see whether he could speak to me. I was shown into his room, but, before I went up, the attending physician, who had just left him, met me at the foot of the stairs, and said his death was a question only of hours, or at most only of three or four days. Three consulting physicians had arrived at the same conclusion; and I was so sure that his death was imminent that I afterward wrote home to advise a friend to prepare his family for the sad result. I went into his room and found him the very picture of dissolution. He smiled his old smile, and, after a few words had passed and I suppose he saw upon my face the expression of profound sympathy, he said: 'Well, I suppose they have told you that I am going to die, and I suppose I am, although I mean to get home first if I can; but,' said he, 'I have been trying to amuse myself while I am dying by inventing something that will enable me to die with credit. I want to make the basic process practicable, and I have just perfected here upon my bed the details of the movable shell; and if I don't live long enough myself to introduce it, I have explained it in full to my assistant, so that this invention shall be known to my countrymen.' His recovering as he did, rising, as by a miracle, from that death-bed, only adds to this remarkable evidence of the extraordinary vitality and energy which characterized him, and which surpassed that of any man I ever knew."

He did indeed "die with credit;" and his countrymen have shown themselves not unworthy of the devotion with which he served them to the last. In acknowledging the value of his work, they approve their own capacity to judge; in honoring his memory, they honor themselves; in such acts of generous justice as we have here recorded, they echo the spirit of his noble life.

THE MIDLOTHIAN COLLIERY DISASTER.

EDITOR ENGINEERING AND MINING JOURNAL:

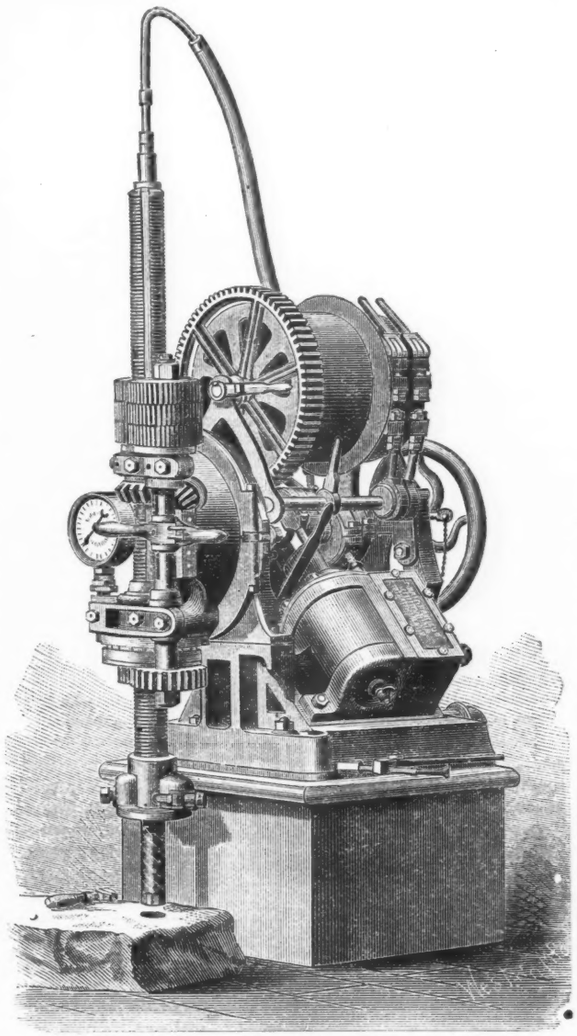
SIR: I notice in your journal an article over the name of Oswald J. Heinrich, M.E. Had not the reading of the same conveyed the idea that the writer had a personal knowledge of the Grove shaft workings immediately anterior to the unfortunate explosion, I would not deem it worthy of my notice. I will only say I have been here faithfully attending to my duties since May, 1877, and know that Mr. Oswald J. Heinrich, M.E., has not been down the Grove shaft since it has been in my charge, and that he has no personal knowledge of the bottom workings since he left the mine in December, 1876, soon after the explosion of that year in the same mine, while he was in charge. The best answer to his charge that "the mouths of some of the men employed there now may be unfortunately sealed by fear," is, that the New York *Herald* had one of its best reporters and most expert interviewers on the ground for five days following the accident, and he talked freely with all the miners and citizens, gathering information for his paper without fear or favor. It does not appear, nor is there an insinuation in his report, that there was any thing concealed or evaded by the employés. I am ready at any time for the most searching investigation of any charges of mismanagement, when properly brought. Very respectfully,

MIDLOTHIAN, VA., Feb. 22. GEORGE DODDS, Supt.

THE KOEPE SYSTEM OF COLLIERY WINDING.

Mr. C. M. Percy, a prominent English mining engineer, has recently, before the Manchester Geological Society, in dealing with improvements in colliery winding engines, described the Koepe system, which deserves much attention. Mr. Percy says:

In the days of our forefathers, when mines were worked near the surface, winding was not an important matter; any engine or rope or drum would do. But with depths of 600 and 800 and 900 yards, and in the future with even greater depths, it becomes quite a different matter. What we want is, that the load upon the engines shall be as uniform as possible, and several methods have been tried with the view of accomplishing this desirable end. In the North of England, counter-balance chains are used, and for vertical drums and flat winding-ropes do well enough. The spiral drum, of which we have some examples in this district, is constructed so that the load multiplied by the diameter of the lap is the same all through the winding. The cylindrical drum, with a tail-rope or balance-rope under both cages, answers the same purpose, if the sump is deep enough, and the shaft moderately free from horse-trees, landings, and pipes. The general practice is to let the balance-rope work unguided in the sump, but the excessive freedom has proved troublesome. Mr. C. F. Clark, of the Garswood Coal and Iron Company, has had the balance-rope working in this manner, but has had occasion during the last few months to make an alteration which the writer thinks an improvement. A pulley is placed in the sump, and, under ordinary circumstances, the pulley around which the balance-rope works is stationary. But as the pulley is arranged to slide freely up or down between a framework, a two-fold advantage is derived. The balance-rope always works steadily and keeps its position, and has no tendency to form the loop so usual with this arrangement; and should one cage be drawn too high without the other cage descending, the pulley rises freely and smoothly, and in all circumstances keeps the balance-rope right. Mr. Clark, who has kindly placed particulars of this arrangement at the disposal of the writer, has within the past two days made a communication to the effect that "our tail or balance-rope works admirably. We have not had the slightest hitch since it was put on." But all these drum appliances only partially meet the difficulty. The Koepe system goes into the matter thoroughly, and dispenses with drums altogether. The principle of the Koepe system is, that no drums are needed, and, instead, a pulley is placed upon the crank-shaft. The main winding-rope—for there are several—has a cage at each end, and merely passes half around this drum-pulley. Under the cages there is the ordinary balance-rope just described, and there are two additional or safety-ropes about half the strength of the main winding-rope. These safety-ropes pass over two pulleys placed in the head-gear, and take hold of both cages. These safety-ropes have nothing to do but move about so long as the main winding-rope keeps right, and there is less danger of any thing happening to the winding-rope in the Koepe system than with ordinary winding appliances. But nervous spirits seeing that only one main winding-rope is used, and that, in the event of this giving way, the whole affair would go down the pit, it was thought an improvement to attach these two light safety-ropes. If the main rope breaks, these safety-ropes come into operation, and both cages remain suspended safely. Sometimes there are no conductors, the idea being that the movement in winding is so steady that none is needed. The advantages claimed for the Koepe system are: (1.) Drums are dispensed with and a simple pulley substituted. The expense of drums is saved, and the weight, which is something enormous in large winding-engines, avoided. The engines are brought closer together, thus lessening the length and diameter of crank-shaft, and the winding-engine house does not need to be nearly so wide. (2.) The load upon the engines is reduced to a minimum and made absolutely good throughout the winding. By this means, a smaller pair of engines will accomplish the work. (3.) The pulley upon the crank-shaft can be made exactly equal in diameter to the head-gear pulleys, and the main winding-rope is thus always coiling upon the same side. (4.) The main winding-rope is always working in the same line, and there is no side movement, with its injurious influence. (5.) Only one main winding-rope is needed, the balance-rope being one which has done its work as a winding-rope, and the safety-ropes being light, and having next to nothing to do. (6.) The whole of the winding-rope is always easily got at for thorough inspection, and no parts of one wearing themselves away by injurious grinding influence upon other parts. Unfortunately for himself, for the paper, and for the audience, the writer has never seen the Koepe system at work, although he hopes to do so shortly, but believes that in its leading principles it is correct. It seems unwise not to have conductors in all cases, and perhaps the main winding-rope, instead of only passing half around the drum-pulley, should be made to pass at least once around. But in its abolition of massive winding-drums, it is clearly a step in the right direction, and it does seem to give a less load and a more uniform load upon the engines than any other arrangement. At several places on the continent, the system has been working well for years, and has lately been introduced into England and applied at the collieries of the Bestwood Coal and Iron Company. Messrs. Nasmyth, Wilson & Co., of Bridgewater Foundry, Patricroft, near Manchester, write on the 4th of January, that "the Koepe system is being successfully worked at Bestwood, and we have orders for a similar plant at a large colliery in South Wales.' It seems to the writer of this paper that, by combining without injurious complication the benefits derived from the condensing arrangements of the North of England, with the advantages derivable from the Koepe system, we should possess an almost perfect winding appliance.—*Coal.*



THE LITTLE CHAMPION ROCK DRILL.

THE LITTLE CHAMPION ROCK DRILL.

As a machine for prospecting above and below ground, the diamond drill has a field of its own, which is secured to it by the fact that cores of the rock through are obtained, and that the hole can be started in any direction. The advantages of this class of drills are now so generally known that we need not dwell upon them at the present time. We propose to call attention to a more recent design, by Mr. M. C. Bullock, of Chicago, formerly connected prominently with older diamond drill companies. The Little Champion machine, which we illustrate, has become popular within a few years, and there are now over sixty machines at work alone in the Lake Superior District.

Our illustration well shows the general arrangement, which is very compact, a fact which those working such machinery in drifts or shafts will fully appreciate. As generally built, diamond drills are run by oscillating engines. Mr. Bullock, with the purpose of avoiding the vibrations and incidental drawbacks due to this arrangement, permanently secures his two steam-cylinders to the bed-plate at an angle of 45 degrees to its base-line, and at right angles to each other. The steam enters a chamber in the bed-plate first, a throttle slide-valve, moved by the lever shown at the bed-plate in our engraving, serving to regulate the flow of steam to the steam-chests. The steam is distributed by balanced slide-valves arranged to cut off at two thirds stroke. The reciprocating movement of the trunks and pistons is converted into a rotary motion for driving the drill by means of a crank-shaft to which the connecting-rods are attached. On the same shaft are the eccentrics by which the proper motion is imparted to the valves. At the front of the crank-shaft, or that end facing the drill proper, is keyed a bevel gear-wheel not visible in our illustration, which meshes into and drives a similarly-beveled gear-wheel, which is indicated just above the gauge shown in our drawing. The feed-screw, which in our illustration is clearly shown, is mounted in and driven by the beveled gear just spoken of. It is fed by a vertical countershaft which will be recognized by its handles. In its upper portion, this countershaft bears three gears, meshing with three corresponding gears on the feed-screw. They are provided each with a different number of teeth, so as to obtain a variable feed, as either one or the other pair is made to engage. This is reached by raising or lowering, by means of the handle shown, a piston in the hollow countershaft, thus permitting a change of feed while the machine is running. The thrust of the bit is carried by a bearing, which will be found below the gauge in our drawing. It is so constructed as to contain an annular hydraulic cylinder, the pressure upon the liquid being indicated on the pressure-gauge. By this means, the change from one stratum to another of different hardness is indicated, and those who have used the machine speak approvingly of this feature. The bearing itself consists of a series of conical rollers inclosed between a retaining ring, and their outer ends have spherical surfaces of much smaller diameter than that of the ring in which they are, so that only a small portion of the roller is in contact with the ring, and that at the center of the end where there is least motion. By this means, it is intended to reduce the friction to a minimum.

The feed-screw and all its connections are carried by a swivel-head, and it is connected with the frame in such a manner that the bevel-gears will always be in mesh with each other when the drill is in position for

drilling holes, no matter whether they are to be drilled in a vertical line or at an angle. The swivel-head arrangement allows of the whole drilling apparatus to be swung out of the way when it is desired to remove the rods from the hole. In order to effect this latter manipulation as rapidly as possible, a hoist is provided. The arrangement is simple. To the main shaft driven by the engines is keyed a grooved pinion, which meshes into the spur-wheel shown alongside of the rope-drum in our engraving. By a lever, which is also shown, the shaft on which the spur-wheel is mounted can be raised or lowered, so that it can be made to engage and the hoist can be made to operate. The rope on the drum is simply led to a pulley or sheave placed directly above the hole. The drill-rods themselves, 1⅝-inch in diameter, are made of charcoal iron, lap-welded tubing, and are fitted with Osgood's bayonet clutch coupling, which uncouples by giving it one fourth of a turn, thus saving much time in coupling and uncoupling the rods.

Our brief description may suffice to show that Mr. Bullock has paid close attention to details, and we may mention that he has, besides, a number of minor contrivances, all intended to contribute to the one end of facilitating work and guarding against accidents. The machine is made in parts, all weighing less than 300 pounds, so that it can be carried on mule-back. How largely it is used for prospecting, may be gathered from the fact that the Quincy copper mine of Lake Superior is using it, boring 500 to 800 per month of horizontal holes, mostly at right angles to the formation. In that work, nuggets of native copper are frequently encountered; but there is little difficulty in passing through them at a slow rate of speed.

As an instance of how varied the ground passed through may be, we may cite the following report of work done from the beginning of September to the middle of December, 1881, at Clarksburg, in the Lake Superior iron district, by the A. H. Dey and Dexter mining companies. In the first hole, a four-inch pipe was driven 58 feet, then 28 feet were drilled in jasper, 33 feet in hard hematite, 44 feet in second-class iron ore, and 70 feet in quartzite. The second hole was put through 255 feet of quartzite. The casing of the third hole was down 59 feet, when it struck a boulder. The casing was drilled through two boulders; but as the last one was in quicksand, it canted, and the casing and hole were lost. Then a second 4-inch pipe was put down 76 feet to the rock, and 38 feet were drilled through jasper and soapstone, followed by 29 feet of hard ore and by quartzite. In the fourth hole, a four-inch pipe was driven 102 feet down to rock, and then drilling was done through 160 feet of jasper, 30 feet of ore, and over 100 feet additional of rock.

THE WASHINGTON MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

THE FIFTH SESSION.

On Thursday morning, the members assembled at the New Museum, Professor Thompson being in the chair. The first paper read was by Mr. H. S. Munroe, on the first aid to the injured.

Mr. N. S. Keith presented a paper on electrical apparatus and the application of electricity. Mr. Keith, in introducing his subject, claimed that mining engineers and metallurgists ought to follow developments in electrical science closely, as it offered many opportunities for improvement. As instances, he mentioned that the electrical call bell, a simple and cheap apparatus, had many advantages for ready communication in mines and works, and that the telephone possessed many obvious means of saving time and labor. Electric lighting by the voltaic arc might be introduced with very satisfactory results, as experience had shown in mines and mills, although it was doubtful whether it would supersede other systems of illumination in the working of narrow veins, as the quantity of light was more than was needed. In the driving of the new Weehawken tunnel near New York, there are eleven arc lights on one circuit of two and a half miles in length, to illuminate the different open cuts and shafts in the line of the tunnel, and it had been found that more and better work could be done. Mr. Keith briefly described the utilization of electricity for the transmission of power as employed currently for hoisting coal in an incline in a colliery in the Loire District, France.

Passing to the application of electricity in metallurgy, he stated that at Swansea the refining of copper by the electrolytic method has been practiced for some years successfully. Black copper plates, containing gold and silver, are made the anode in a sulphate solution, pure copper plates being the cathode. When a current of electricity generated by a dynamo-electric machine is passed through it, the copper in the black copper is dissolved, and a pure metal, selling at a high price for the use of wire for electrical purposes, is deposited on the cathode, the residue of silver and gold being treated in the ordinary way. This process of refining is also in constant use at Hamburg and at London.

Mr. Keith informed the meeting that he had somewhat modified an analogous process invented by him to treat base lead bullion. Formerly he treated the base bullion directly. He now proposes to separate by this electrolytic method the rich zinc-lead-silver alloy obtained in the Parkes zinc desilverizing process, almost universally used in this country. The treatment of this alloy has always been one of the most serious problems of this process. Mr. Keith states that he dissolves the lead and zinc, and deposits both as an alloy which may be used in subsequent desilverizing operations. The main advantage of this method, compared with that proposed at an earlier date, would be that the quantity thus treated would be much smaller, and that it would be applied to a product handled with difficulty by other means.

Mr. Keith then briefly described the Siemens method of melting metals by the aid of electricity, and referred at some length to the storage of electricity, giving some details on the principles underlying the Planté and Faure storage batteries. The system of storing electricity, though well known to Planté, became practically available only when means had been found, by the perfection of dynamo-electric machines, to generate electricity at a comparatively low cost. The Faure battery, though possessing much value, has been found to have some drawbacks in practical working, the principal one of which is the early disintegration of the lead plates. Mr. Keith has devised a battery based on the principle of the Grove gas cell, which depends upon the the decomposition of water. He stores up in separate reservoirs the gases generated, and by a peculiar mechanical arrangement, details of which are withheld for the present, again utilizes them for the generation of a current of electricity which can be used for any purposes for which it is required. He estimates that it has ten times greater capacity for a given weight than the Faure battery, as the energy required for the decomposition of one pound of water, and therefore the current regained, are much greater.

A discussion followed, in which Professor Thompson, Professor Silliman, and Mr. Howe participated. Mr. G. W. Maynard gave some details on the electric deposition of copper by the Elkingtons of Birmingham, where, he said, 2½ tons of copper were thus refined, an engine of 15 horse-power being used. Professor Silliman stated that, in Connecticut, a company was coating on a large scale steel wire for a new form of conductors by the electrolytic process.

Prof. B. Silliman then made a series of very interesting remarks on some newly-discovered mineral regions in New Mexico. We must, at the present time, give some of the statements in a fragmentary form, leaving for a future issue a full presentation of his descriptions. Professor Silliman first dwelt upon the importance of Socorro, on the Atchison, Topeka & Santa Fé Railroad, 125 miles below Santa Fé, as a prospective important center of metallurgical operations on a large scale. Railroad facilities, the vicinity of an ample supply of coking coals, and proximity to a number of mining districts of great promise and offering varied grades of ore form the foundation of his belief. Three and a half miles from Socorro is the Socorro Mountain, in which are found rhyolites intersected by veins having heavy-spar as gangue, and possessing the peculiarity that horn-silver alone is found plastered over the crystallized cleavages of the heavy-spar. This association of chloride with heavy-spar presented certain difficulties in the mill treatment of the ore. Forty miles west of Socorro, in the Magdalena Mountains, are found large veins of low-grade carbonates of lead, carrying only 4 to 15 ounces of silver, but a considerable percentage of lead. Five to six miles back of the Magdalena Mountains, are found veins of heavy-spar carrying richer silver ores, among which the rare stromierite is noticeable.

Professor Silliman then spoke at length of the Lake Valley District, which is reached from Nutt station on the Atchison, Topeka & Santa Fé Railroad by a good road 12 miles in length. The ore there found is a hematite, heavily impregnated with silver chlorides and carbonate of lead, occasional bunches of galena being also found. In the vicinity is a dike or a series of outcroppings of cherty quartz opening into vuggs of crystalline character. Embolite and chloride of silver distinguish this series. Present developments are not such as to permit a full statement concerning the extent and character of this deposit of silver and lead-bearing hematite. The country rock is limestone, the geological horizon of which is definitely fixed by a fossiliferous bed, which shows it to be not far above the Devonian. Under the fossiliferous bed is a heavy bed of non-fossiliferous limestone, seamed by pitch-like veinlets which lead into hematite heavily charged with silver. As yet, no portion of the hematite has failed to show the presence of silver. From present explorations, it is impossible to form a judgment concerning the permanency of the deposit; but over an area of one mile square, search on any portion of the ground is likely to be rewarded by the discovery of silver ore. It is doubtful, however, whether the deposit will continue to any great depth. In one shaft, 48 feet deep, they have come upon a floor of limestone; but in the same mine, a tunnel started at a depth of twenty-four feet has run over 300 feet in ore. Professor Silliman stated that there was no doubt of the presence of enormous bodies of ore of remarkable richness.

He next called attention to the occurrence of native gold in connection with carbonate of copper and lead in a powerful quartz vein in the Black Hills District, New Mexico. He exhibited specimens from the Ivanhoe mine. He had traced this vein for a considerable distance, finding it 40 feet thick at one point, where, however, it was much broken up. This vein is incased in porphyry. At the bottom of the shaft of the Ivanhoe mine, 100 feet deep, he found a brecciated ore carrying calcite feldspar, much chloride of silver, and gold. At other points, this vein is nearly barren. It is only one of a large number of veins in that region which appear to radiate from Hagon's Peak.

In the afternoon, the members of the Institute visited the White House, and were introduced to President Arthur. They then proceeded to the Treasury department, where they were introduced to Secretary Folger, and visited the various departments of the Treasury.

In the evening, the banquet was held at Wormley's. Speeches were made by General Sherman, Hon. A. S. Hewitt, Ashbel Welch, Hon. G. H. Hoar, Hon. W. R. Kelley, Prof. B. Silliman, J. C. Bayles, P. Roberts, Jr., and Dr. R. W. Raymond.

SIXTH SESSION.

On Friday morning, the members gathered somewhat tardily for the last session. The first paper called for was by Mr. G. W. Maynard on the Siemens direct process at Pittsburg. We have, in the ENGINEERING AND MINING JOURNAL of December 31st, 1881, given such a full description of the plant that we need not at the present time enter upon that part of the subject. We did, however, then present an estimate of the cost of working, made by Mr. Maynard. He was not correctly informed at that time, and it is due to him that we should print the following revision of his earlier figures:

Actual Cost of Producing Blooms by the Siemens Direct Process at Pittsburg.

59 tons Lake Superior ore @ $8	$472
15 tons Tyrone ore @ $4	60
600 bushels reducing slack @ 4c	24
4 tons limestone	4
2650 bushels producer coal @ 6c	159
Pay-roll	351
Total per week	$1,070
Product 38 tons of blooms, cost per ton	$28.15
Repairs and sundries	2.00
Estimated actual cost	$30.15

But in regular working, the four rotators would have produced 90 tons,

and under this assumption Mr. Maynard makes the following estimate of cost per week for four rotators, with the same number of men :

144 tons Lake Superior ore @ $8	$1,152.00
36 tons Tyrone ore @ $4	144.00
1440 bushels reducing slack @ 4c	56.60
9¼ tons limestone @ $1	9.25
6300 bushels producer coal @ 6c	378.00
Pay-roll	351.00
Total per week	$2,091.85
Product 90 tons blooms, cost per ton	$23.23
Repairs and sundries	2.00
Estimated cost	$25.23

Mr. Maynard, in his paper, gave the following estimate of cost of manufacturing open-hearth spring steel, substituting Siemens's direct blooms for Bessemer scrap :

Cost of pig, castings, mill scrap, furnace scrap, spiegel, and ferro-manganese	$15.58
Siemens's direct blooms	13.67
Fuel, sand, fire-clay, nozzles, sleeves, black-lead, oil, molding sand, molds, cost of melting, deduction for loss and credit by pit scrap	7.93
	$37.18

In order to show that the consumption of fuel at Pittsburg, where the cheapness of coal leads to extravagant use of it, was excessive, Mr. Maynard gave the following data on the working at Landore, Wales, from August to October, 1881: 111 charges were made in 21 days and 13 hours, or an average of 5·2 charges per 24 hours of continuous work. During that time, 111 tons of Sommorrostro ore and 66 tons 12 cwts. of hammer scale were charged, a total of 177 tons 12 cwts. of mineral, which yielded 107 tons 9 cwts. of blooms, equal to 60·53 per cent of the weight of the minerals charged. The consumption of fuel was 24 tons 19 cwts. of reducing coal and 135 tons 10 cwts. of producer coal, a total of 160 tons 9 cwts. of coal for 107 tons 9 cwts. of blooms, or 1·49 tons of coal per ton of blooms. At Landore, the time for each charge was a little short of five hours.

From a detailed statement of the work at Pittsburg from December 23d, 1881, to January 14th, 1882, 43,503 pounds of blooms were obtained from 87,500 pounds of ore in 16 charges, an average yield of 49 per cent. Of these charges seven were of 5000 pounds of ore (2500 Cleveland, 1500 Tyrone, 1000 Virginia), and eight were of 6000 pounds (3000 Cleveland, 1500 Tyrone, 1500 Virginia). The time required varied very widely from a minimum of 5·45 hours to a maximum of 14·35 hours, the yield ranging from 63 per cent as a maximum to 42·1 per cent as a minimum, the latter too coinciding with the largest duration of charge.

Mr. Maynard's paper was followed by quite a discussion, in which the phosphorus question was brought up in a somewhat rambling way. Professor Egleston urged that when the blooms were used in the open-hearth furnace it was not really so necessary to guard against oxidation of the bloom during shingling, because the oxide of iron formed would act during the steel process as a decarbonizer very much as iron ore did in the ordinary pig and ore process. Mr. Metcalf, in closing the debate, pronounced himself a firm believer of the old indirect processes of smelting the ores in a blast-furnace, thus getting nearly all the iron in the ore together with some impurities, puddling the pig in the Danks-Bouvard or similar furnaces, and melting the muck bar for the production of steel. He urged that, starting with the same quality of raw material, a purer product would be made, and substantiated his assertion by figures. Mr. Metcalf held also that the quantity of fuel used is smaller, and said that 2240 pounds of coal was the quantity which was used for making one ton of pig, 1140 pounds being required per ton of muck bar for puddling and 1140 for melting per ton of steel, a total of 4520 pounds, as against a ton and a half to two tons for the Siemens direct process alone, not counting the amount used for melting the blooms in the open hearth. We fancy, however, that when Mr. Metcalf makes allowances for loss in puddling, and refers all his figures to a ton of steel made as a basis, they will make a somewhat different showing.

Prof. W. C. Kerr, State Geologist of North Carolina, spoke on some peculiarities in the mode of occurrence of gold in North Carolina. In a paper presented by him at the New York meeting of the Institute, a description was given of the origin and structure of the placers or gravel deposits. The gold was traced to its source in small veins, seams, and strings of quartz intersecting the Archæan schists of the slopes and foot-hills of the mountains. But he had long been coming to the conclusion that gold occurs in these old schists, gneisses, and slates, without the presence of veins, or of any gangue whatever. For example, in one of the oldest and best known and most extensive gold regions of North Carolina, extending 40 miles along the Yadkin and Uharrie rivers, the gold (outside of the placers) is found diffused through a mass of thin, shaly, friable quartzites, sometimes several hundred feet thick. The Jones mine, near High Point, is an example. The mass of the slate is quarried out and sent to the stamps. Again, at a mine in Cleveland County, the gold is found throughout the mass of a body of thin-bedded ferruginous, garnetiferous mica schists.

At the Rhodes mine, gold occurs in the common gray feldspathic gneisses, and in the limestones in the same section, where they are quarried and sent to the stamps in mass, as at the well-known King's Mountain mine. Recently Professor Kerr has ascertained that the felsites and jointed quartzites of the Huronian belt of Middle North Carolina contain workable quantities of gold. These occur in huge masses, forming hills and cliffs, one hundred feet high and more, and are used for road metal and railroad ballast. Finally, the traps (diorites) in the older granitic series (Laurentian) near Charlotte, have been found to be auriferous. These facts seem to justify the conclusion that gold is much more widely diffused than is commonly supposed, and may occur in almost any sort of rocks without the intervention of veins.

Professor Kerr gave at length his views on some interesting phenomena observed on Bald Mountain, to which we shall return at an early date.

The last paper read was by Mr. Willard P. Ward, on the behavior of carbon to manganese. In 1875, while experimenting on the production of ferro-manganese in a blast-furnace, Mr. Ward had burdened the furnaces with a charge which he calculated would produce a 15 per cent spiegel. The furnace was very hot, having been running for a couple of days on a very light burden and making a burnt iron, prepatory to the experiment, which it was proposed to make to produce a comparatively high grade spiegel for those times. Calculating that the charge would come in work in twelve hours, Mr. Ward was surprised to note that there was no change in the appearance of the metal, although there was a decided change in the nature of the cinder, thus showing that the manganese ore had come down. The iron was quite gray and very tough. This continued until the next morning, the furnace being hot, the cinder good, and the iron cast at about ten A.M. being gray. Mr. Ward's machinist declared it impossible to drill the iron in order to obtain a specimen for analysis. A chip broken off showed 16 per cent of manganese. Mr. Ward believes that the production of a pig having such physical properties, and containing so large a percentage of manganese, must be due to the excessively high temperature of the furnace. He holds that graphitic carbon will separate from manganiferous pig just as it will from an iron pig made at a much lower temperature. Mr. Ward urges that this observation may be of some value in discussing the effect of manganese in steel rails, the temperature in the Bessemer converter being so high that it may be likely that the manganese in the rail exists in the same condition as it did in this exceptional pig, tending to make the rail hard, but at the same time tough also.

After the announcement of the election of the officers for the ensuing year, the names of which have already been given in the ENGINEERING AND MINING JOURNAL, the report of the Council of the Institute was read, showing a good financial condition, and a membership of 1030. Resolutions of thanks to the local committee, and those who had extended hospitalities and courtesies to the Institute during its stay at Washington, were offered and passed ; and after a few eloquent words from the retiring president, Mr. William Metcalf, the meeting was declared adjourned.

LETTERS FROM THE WEST.—VII.

Special Correspondence of the Engineering and Mining Journal.

SAN FRANCISCO.

Of the metallurgical establishments of San Francisco, the most interesting is the small works at Oakland, where the native oxides of antimony imported from Sonora are reduced.

A word with regard to the ore and its mode of occurrence. It comes from the northwestern portion of Sonora. A short range of mountains, the Sierra del Alamo Muerto, skirts the eastern shore of the Gulf of California at about thirty miles from the gulf and fifty miles from El Altar. On the northern flank of the range, an area of considerable extent is strewn with quartz and a heavy yellow mineral. This is said to have been long ago amalgamated for silver, but to have yielded so base an amalgam (perhaps from the presence of a little native antimony) as to have been rejected as a silver ore ; and its true character seems to have been either overlooked or mistaken until recently. Samples were sent to England, and the value of the mineral as an ore of pure oxide of antimony was at once recognized. Shortly after that, Professor Cox, late of the Indiana survey, made arrangements with the owners to ship the ore for treatment to works he erected in Oakland, Cal.

There appear to be three systems of veins within an area of about four square miles.

First. The most northerly group, the San José, was (when I was there last winter) the most productive in antimony ; but it carried no silver.

Second. The Santa Margarita group lies between the preceding and

Third. The Argentine group.

Both the second and third are silver-bearing ; but the first, though barren in silver, was, where opened during my visit, richer in antimony than the latter. The size and yield of the veins have, I believe, proved very variable ; but the area of ore over which the mineral is found is so large and the number of veins, apparently distinct, so many, that the district promises to be an important producer, though how important more extended mining alone can determine. It is, however, the only group of mines yielding an exclusively oxidized ore in workable quantities. To what depth this oxidation has extended is as yet unknown. The ore (*stibiconite*) is of a bright yellowish-green color, irregularly jointed, and breaks with a rough conchoidal fracture. Pure specimens yield the theoretical quantity of antimony, but such ore can not be obtained in quantities. The highest percentage to which it can be hand-picked is 50, and the average of the ore as broken is far below this. A specimen well coated with chloride of silver yielded me 120·75 ounces of silver ; but this is no doubt much in excess of the average, which, however, is high enough to constitute the product of the second and third groups good silver ore. The silver lies chiefly as a distinct film, greenish in freshly-broken samples, but which darkens on exposure to the light, between the joints of the ore ; but it may be also distinguished by the eye upon the compact broken surfaces.

The extraction of this silver on a working scale has not yet been attempted ; but experiments by Professor Cox have shown that it is not freely soluble in either brine or hyposulphite of soda, but amalgamates readily with mercury, making apparently a pure bullion. That it should resist the solvent action of hyposulphite and alkaline chloride is in accordance with the general observation that native argentic chloride is with difficulty attacked by these reagents, and that artificially chloridized silver becomes in time insoluble. It is only recently, for instance, that silver has been extracted from the ores of Nevada City and Grass Valley, Cal., as described in my letter in your issue of December 24th, 1881. The extensive piles of old tailings at the Providence mill contain about 20 ounces of silver, which when freshly roasted could have been extracted, as is now done, but by weathering has become quite insoluble. That the silver in these antimony ores should make a pure amalgam, is contrary to the tradition already referred to as prevalent in this part of Mexico.

OAKLAND REDUCTION-WORKS.

As yet, the ore treated at Oakland has been from the San José or silverless group of mines. At first, reverberatory smelting was attempted, but

with such ill success that a cupola was resorted to, and now very excellent work is done in a round, close-fronted, water-jacketed furnace of the following dimensions: 36 inches diameter, 6 feet from tuyeres to feed-door, 18 inches from tuyeres to bottom of crucible. The tuyeres have a slight dip. The blast is produced by a No. 2 Root blower. The fuel used is San Francisco gas coke, which costs from $7 to $8, and, though found to be less effective than English coke, is nevertheless cheaper. The charge consists of 80 pounds ore, 100 pounds slag, 30 pounds coke. The resulting slag is returned to the furnace till it is perceived to be becoming too acid, when 10 pounds of a pure iron ore are added to the following charge.

The metal and slag are tapped together into slag-pots. Seven tons of ore is the average consumption by the furnace in twenty-four hours. A very inefficient smoke-condenser, in the form of a mere enlargement of the furnace-stack, is the only provision for saving the antimony smoke. Hence the furnace yield is only 77⅔ per cent of the assay value of the ore, or 40 per cent of antimony.

The coarse antimony is refined in crucibles, heated each in its separate furnace. The charge in each crucible is: 40 pounds of coarse antimony, 2 pounds of sulphide of antimony (pure native stibnite), ½ pound carbonate of potash. The contents of the crucibles are poured into square molds of exactly the same size and shape as the English, and the surface is very beautiful and deeply starred.

The slag removed from the coke is returned twice without addition to the refining crucible and to ten charges more, with the addition each time of a little stibnite and potash. The final cleaning of the cakes by scrubbing is a tedious operation, and most expensive of labor; but the resulting metal will compare with, if it does not exceed in beauty and excellence, the best imported. The works were turning out last October, and expected to keep up, a production of ten tons weekly; but I regret to learn that subsequently to my visit they were closed, owing to a disagreement with the owners of the mines and a consequent stoppage of supply.

Messrs. T. J. Pope & Brother, of 292 Pearl street, who are the agents for the sale of the Sonora antimony, issued the following interesting postscript to their circular of October 31st, 1881:

By request of Messrs. Hallett & Fry, we publish their letter to us, and also give below the analysis made of their antimony by Messrs. Booth, Garrett & Blair, of Philadelphia, dated October 27th, 1881.

THOMAS J. POPE & BROTHER.

NORWAY WHARF, 202 ROTHERHITHE, LONDON, S. E., Sept. 26, 1881.

MESSRS. THOMAS J. POPE & BROTHER, 292 Pearl street, New York:

GENTLEMEN: We have received a copy of your prices current, dated 5th inst., and observe that in your remarks respecting antimony, you state that "the quality of the Sonora brand is far superior to any in the market." We beg to inform you that we have just had an analysis made by Mr. F. Claudet, one of the first London assayists, and that this gives

Antimony	99·46
Impurities	·54

This confirms analyses which have been made at intervals during many years, and proves that Hallett's brand is as nearly pure as a commercial article can be.

Trusting that you will give publicity to our statement, we are, yours truly,

HALLETT & FRY.

Comparative Analyses of Cookson's and Hallett's Best Antimony, and of Sonora Antimony Co.'s Ordinary Antimony, from Messrs. Booth, Garrett & Blair, of Philadelphia.

August 25th. *Cookson's Antimony.*	Per cent.	October 27th. *Hallett's Antimony.*	Per cent.	August 13th. *Sonora Antimony.*	Per cent.
Arsenic	1·008	Arsenic	1·705	Arsenic	0·036
Copper	0·021	Copper	0·066	Copper	0·052
Lead	0·410	Lead	0·440	Lead	0·538
Iron	0·144	Iron	0·027	Iron	0·039
Zinc	none	Sulphur	0·149	Zinc	none
Cobalt / Nickel	0·013	Zinc	none	Cobalt	traces
		Cobalt / Nickel	0·033	Nickel	none
Sulphur	0·064			Sulphur	0·254
Total impurities	1·660	Total impurities	2·420	Total impurities	0·919
Remainder antimony.		Remainder antimony.		Remainder antimony.	

I believe this is not the first attempt to smelt antimony ores on the West coast. A futile endeavor was made some years ago in San Francisco to utilize antimony ores from California by the Stayton Mining Company, in reverberatory furnaces; and experimental works were run for a short time by G. W. L. Faber at Battle Mountain Station, Nevada, on *stibnite* from Humboldt County.

On the Atlantic coast, a low-grade antimony ore is mined and concentrated near Lake George, but not, I believe, reduced. And works of considerable extent for mining, concentrating, and reducing the *stibnite* found in the parish of Prince William, York County, New Brunswick, were in operation ten years ago under the Lake George Mining Company, but do not appear to have done a very prosperous business.

A promising enterprise is, however, soliciting public favor from Utah. According to Mr. W. P. Blake, in Iron County, Southern Utah, 35 miles southeast of Marysvale, a bed, or perhaps two almost contiguous beds, of *stibnite* lie between strata of sandstone over an area exceeding 400 acres. The beds at places attain two feet in thickness, and at others disappear; but Professor Blake assumes as within the truth that there are six inches of ore over half the area, and calculates that, as this ore can be reached by adit from outcrops in galleries at many points, the cost of mining will be light.

The slight developments made in doing assessment-work since Professor Blake's visit are said to fully bear out his sanguine expectations. The ore is certainly of a very superior quality. One of our Eastern chemical manufacturers finds it so free from any impurity but silica that he uses it as it is, instead of the imported crude antimony, in the manufacture of salts of antimony. The company is now soliciting funds to build concentrating-works at the mine and reduction-works at Salt Lake City, where, owing to the low cost of the impure soda from the lake shore, that base will be used in the reverberatories instead of iron.

If the hopes of the company are realized, this country will soon become an exporter of antimony. Though England is the largest manufacturer, it derives its main supplies of ore from Borneo. Two English houses, those of Cookson and Hallett, have heretofore supplied the world, exclusive of France and Hungary, where, from native ores, home demands are satisfied. And yet the English production does not probably exceed 25,000 tons, while the demands of this country can be supplied with from 900 to 1000 tons a year.

Some of the hard leads of the West carry between 10 per cent and 20 per cent of antimony, and are used for the manufacture of lead-antimony alloys, reducing, of course, the demand for the free metal in our markets. The consumption of antimonial compounds, however, in the rubber manufacture and in dyeing is a rapidly growing quantity, and therefore the American Antimony Company need not fail for want of a market for its products.

J. D., JR.

ELECTROLYTIC DETERMINATION OF COPPER.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: My attention has been called to an article by Luckow,* in criticism of my article on the electrolytic determination of copper,† in which he takes exception to my statement, that from a nitric acid solution of copper, free from organic matter, it is "*extremely difficult*" to precipitate all the copper. This is certainly too strongly worded, and I now desire to retract the expression, and to explain my reasons for using it.

It has frequently happened to me, in attempting to precipitate copper out of its dilute nitric acid solution, the precipitating dishes being arranged in a series, that at the expiration of twelve to fourteen hours the precipitation was only partial; while if the metal had been there as sulphate, it would have been complete; or if citric acid (or other organic matter) had been added in the first place to the nitric acid solution, the copper would have been deposited with great regularity and completeness.

If we have a series of five precipitating dishes connected with a series of six Bunsen cells, and the copper solutions all contain small quantities of lead, which is very frequently the case, we shall have a formation of peroxide of lead on each positive pole, thus forming a series of *five secondary batteries*. Now, these secondary cells tend to increase in strength, while the Bunsen cells decrease in strength, so that finally equilibrium is established between the opposed currents, and the electrolytic action is stopped. If this takes place before the copper is all precipitated, we have the condition of things which caused me to use the term "extremely difficult."

Of course, the remedy is obvious—to increase our battery power, and thus to obtain complete precipitation of the copper from the solution.

HOBOKEN, N. J. J. B. MACKINTOSH.

TINTS FOR INDICATING MATERIALS IN DRAWING.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I find among those engaged in the teaching and practice of drawing and engineering a very great diversity as to the tints employed for indicating the various materials used in constructions. Conventional signs are useful in proportion as they are uniform in their significance, and hence need no special interpretation and admit of no uncertainty as to their meaning.

Will the readers of the ENGINEERING AND MINING JOURNAL please indicate the colors employed by them for the various materials used in constructions, and also make any suggestions based upon their experience as to the best method of securing the desired uniformity of usage?

RUTGERS COLLEGE, E. HASBROUCK.
NEW BRUNSWICK, N. J., Feb. 20.

SILVER CLIFF MINING COMPANY versus MOREY & SPERRY.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The action brought about a year ago, in the Court of Common Pleas, by the Silver Cliff Mining Company against Morey & Sperry for fifty thousand dollars damages, for an alleged breach of the contract for the construction of the Silver Cliff Mill, was last week discontinued by the plaintiff, and the costs paid by the same. Olin River & Montgomery appeared for plaintiff, Branch & Branch for the defendants.

THE PRODUCTION OF THE EDGAR THOMSON STEEL-WORKS.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Mr. Windsor Richards, in his report of the production of ingots of the Edgar Thomson Steel-Works, and of the Bethlehem Works, for November, 1881, reports it as 15,235 and 15,729 tons respectively, when it should be 16,235 and 16,729 tons.

WILLIAM R. JONES.
BESSEMER, PA., Feb. 20.

PROGRESS IN SCIENCE AND THE ARTS.

Consumption of Coal in France.—For the year 1880, the consumption of coal in France was distributed as follows, according to *La Houille:*

Railroads	2,499,000 or	9·6 per cent.
Ocean steamers	450,000 "	1·8 " "
River steamers	112,000 "	0·4 " "
Mines	1,112,000 "	4·4 " "
Other industries	3,819,000 "	15·1 " "
Iron and steel-works	4,546,000 "	17·9 " "
Other metallurgical works	141,000 "	0·6 " "
Salt-works	115,000 "	0·5 " "
Domestic fuel	12,606,000 "	49·7 " "

About 31·3 per cent of the fuel consumption was for the generation of steam.

The Ventilation of the St. Gothard Tunnel.—During the work of driving the St. Gothard tunnel, the men employed suffered very seriously from poor ventilation, and their performance, too, was naturally low. It seems that the quantity of air delivered to the tunnel in the north end was about 2,750,000 cubic feet and in the south end 3,125,000 cubic feet per day of twenty-four hours. As the number of men employed was 380 and 420 respectively, or 800 in all, the quantity of air furnished per man per minute was 5·0 and 5·2 cubic feet. When this is compared with the quantity of fresh air that is generally

* *Chemiker Zeitung*, 1882, Nos. 2-3. † *Chemical News*, v. 44, p. 279.

considered necessary in mining, or from 35 to 70 cubic feet per man per minute, the quantity supplied at the St. Gothard tunnel will be conceded to have been very small. If it is assumed that a workman requires per hour 0·84 cubic feet of oxygen and a lamp burning 29 grams of oil per hour, 1·80 cubic feet, and that the former produces 7·60 cubic feet of carbonic acid and the latter 1·14 cubic feet, the total consumption of oxygen would be 2·64 cubic feet, and the generation of carbonic acid in the same time would amount to 8·74 cubic feet, the reduction in the quantity of oxygen in the air in the tunnel would be about four per cent and the increase in the quantity of carbonic acid would be 0·6 per cent of the total quantity of air supplied. Experience in mining has proved, however, that the deterioration of air brought about by the breathing of the men and the burning of the lamps accounts only partially for the reduction in the quantity of oxygen in the air of mines and the increase in the quantity of carbonic acid. Herr Dr. Schondorf concludes, from experiments made in the Saarbrücken coal mines, that it will account only for one seventeenth of the former and one ninth of the latter. Besides the deteriorating action due to the decomposition of pyrites, the rotting of timber, etc., the burning of large quantities of explosives has much to do with the deterioration of the air. In the St. Gothard tunnel, 725 pounds of dynamite were used daily. Herr Pieler, after reciting these facts before the German Society of Engineers, criticises the management of the St. Gothard tunnel sharply, stating that 15 horse-power engines at both ends of the tunnel would have been sufficient to drive the necessary ventilating apparatus, and urges that it will not do to draw conclusions from the experience at that tunnel concerning the possibility or impossibility of driving longer tunnels.

Transatlantic Lines and Steamships.—Under this title Mr. A. J. Maginnis has given to the Liverpool Engineering Society an interesting summary of the great shipment lines which ply between Europe and this country. There are now in existence twenty different lines, having in all 181 steamers, with an aggregate tonnage of 566,262 gross registered tons, of which 121 vessels of 377,607 tons sail under the British flag, 32 of 97,395 tons under the German, 12 of 31,761 tons under the Dutch, and 12 of 47,083 tons under the French flag. The stars and stripes can claim only 4 steamers, having an aggregate tonnage of 12,416. The Cunard line began in 1840 by dispatching the Britannia from Liverpool to Boston on July 4th, followed in rapid succession by three American lines, the famous Collins line appearing in 1849. To show the growth of the vessels engaged in the transatlantic passenger and freight service, we may mention that the Britannia, built in 1840, was 230 feet long, had a breadth of beam of 34·5 feet, and a depth of hold of 22·5 feet, her tonnage being 1150, and her engines, which drove paddles, being 440 horse-power. The paddle steamer Arctic, of the Collins line, which was in its time famous for its dash, speed, and superior appointments, was built in 1850 at New York. She had a length of 290 feet, 45-foot beam and 31·5-foot depth of hold, with engines of 1000 horse-power. Now the Inman line is building at Barrow the City of Rome, a screw ship 600 feet long, 52·3 feet wide, and 38·7 feet deep. She is driven by 2000 horse-power engines. In 1853, the Baltic, of the Collins line, beat the record with a run of 9 days 16 hours and 33 minutes, from Queenstown to New York, and in 1852, the Atlantic, of the same line, made the trip from New York to Queenstown in 9 days 17 hours and 15 minutes. Over the same distance, the Arizona, of the Guion line, made the trip in 1879 and 1880 in 7 days, 8 hours and 11 minutes, and 7 days 10 hours and 47 minutes, respectively.

GENERAL MINING NEWS.

ARIZONA.

COPPER QUEEN.—The superintendent telegraphs that 44 tons of copper were produced during the four days ended February 23d.

TOMBSTONE DISTRICT.

Reviewing the operations of the mines for the week ended February 19th, the Tombstone *Epitaph* says:

BOB INGERSOLL.—The main vertical shaft is down 292 feet. There have been three drifts run from the bottom of this shaft, one to the south, one north, and one easterly. At 190 feet down, there are two drifts, one running northerly and the other southerly. These drifts are not on the vein, being levels from which to tap and work the vein at different points. There was ore in the main shaft down to 80 feet, when it dipped away easterly, whence it has been followed upon the incline 330 feet. They have drifted in ore on the strike of the ledge 80 feet. The ledge runs from 2 to 14 feet thick. The ore is gray and yellow carbonates and green chlorides, with occasional bunches of rich argentiferous galena. They have on the dump from 2200 to 2300 tons of rich ore. A contract has been concluded with the Boston mill to work 1000 tons of this accumulation. Will commence to send it forward to the mill in a few days.

BRADSHAW.—Work on the first and second levels is progressing steadily. The ore-breasts are looking better. The mill is nearly ready to start work.

CONTENTION.—The Flora Morrison shaft has reached a depth of 540 feet. The stopes on the 212 and 312-foot levels are looking well. Work on the Contention new works was somewhat hindered last week by putting in a new spur-wheel for one of the hoists. Raising sufficient rich ore to keep the mill running at its full capacity, which is 75 tons per day.

GIRARD.—The mill is running steadily and at its full capacity upon the accumulation of ore from the development-work. Work in the mine is confined principally to making connections for the more perfect working of its various levels.

GRAND CENTRAL.—They were putting in the station for the 600-foot level at the new shaft yesterday. For the last 50 feet in the shaft, the rock was very hard, but now it is softer and working better. Have connected the 300 level, old works, with the cross-cut west from the new shaft; also, have connected the 500 level with the joint winze on the Contention line. Cross-cut on the 600 level is approaching the ledge, and indications are favorable. They are hoisting the usual quantity of ore, which goes forward to the mill.

TOMBSTONE.—There is no diminution in the output of the mines of this company. A new incline shaft has been started south of and below the combination shaft, to open up and the more easily work the great ore-body in this part of the Good Enough. The West Side holds its own in quantity and quality of ore. The mills are working well and up to their full capacity.

VIZINA.—Drift on the 400-foot level is now in 125 feet, the face being in quartzite. Winze from the Sumner drift is down 20 feet. The drift running northeast from the Sumner has been connected with winze No. 5, and for 68 feet shows a continuous body of high-grade ore on the west wall. The stopes are looking well, and are shipping about 18 tons of ore per diem to the Boston mill. The Yreka shaft is 58 feet in depth; still in cement.

CALIFORNIA.

THE BODIE DISTRICT.

Superintendents report developments for the week ended February 18th as follows:

BODIE CONSOLIDATED.—During the week ended February 18th, the north drift from winze No. 9 was advanced 6 feet. Its total length is 123 feet. The rock is very hard, and there is no change in the vein. The west cross-cut from winze No. 13 is 56 feet long. The south drift from winze No. 16 is now 11 feet long. The amount of ore sent to the mill was 76·24 tons, and there were 73 tons extracted from the mine. There were 104·9 tons of ore crushed at the mill. The average assay value of the pulp was $44.48. The bullion shipped amounted to $7665.12.

BULWER CONSOLIDATED.—The west cross-cut from the 700-foot level of the Standard shaft is in 450 feet; progress, 8 feet. The rock is hard. The west cross-cut from the south drift on the 500-foot level of the Standard mine is in 324 feet; progress, 8 feet, in hard blasting rock.

GOODSHAW.—Owing to the strong flow of water, but three feet were added to the drift. It is expected that the water will soon be under control.

LENT SHAFT.—Cross-cutting from the 800-foot station has commenced. The distance advanced is about 40 feet. The station is finishing.

STANDARD CONSOLIDATED.—The number of tons shipped to the mills during the past week was 1078 of ore from the 385, 500, and 550-foot levels. Crude bullion received, 1710 ounces. Amount shipped to the company was $15,513.35. The shaft has been sunk during the past week 10 feet; total depth, 1172 feet. There is no change to report in the character of the rock cut through. The east cross-cut, 1000-foot level, has been driven since last report 20 feet. The face is still in broken country rock with seams of clay and quartz. The east cross-cut, 700 foot level, is in 737 feet; progress for the week, 10 feet. The rock remains unchanged. The west cross-cut, same level, is in 450 feet; progress, 8 feet. The south drift, 500-foot level, has been run 15 feet; total length, 695 feet, showing a vein four feet wide. West cross-cut No. 1 is in 324 feet; progress, 8 feet. The rock is hard. West cross-cut No. 2 has been advanced during the week 12 feet. Its total length is 136 feet; also in hard rock. North drift from this cross-cut is in 78 feet. The stopes show no important change. The vein on the 385-foot level holds its usual width, and on the 550-foot level (incline) the vein in the stopes is from 15 to 20 feet wide of clean ore.

TIOGA.—East cross-cut No. 2 has been advanced during the week 5 feet, the total length being 123 feet. In west cross-cut No. 4, the progress has been 3 feet; total length, 150 feet. The formation in both the east and west cross-cuts continues the same as last reported. North lateral drift No. 2 has been driven 9 feet during the week; total length, 47 feet. The rock is becoming much harder, and breaks very short. The entire face is in a mixture of quartz and porphyry. South lateral drift, which is designated as No. 1, was started at the beginning of the week on the same vein as north lateral No. 2, and has been driven 13 feet. The vein, as far as followed, continues in size about the same as at the starting-point.

COLORADO.

GILPIN COUNTY.

RARA AVIS.—The *Register-Call* reports that the new concentration-works of this company are running. The mill has a capacity of from 40 to 50 tons of crude ore per day. Of the Whitney mine, the property of this company, the same paper says: The present heading of the adit driving to connect with the 300-foot level from the main shaft has gained a distance of 253 feet from the initial point of the cross-cut tunnel where the vein was struck. The distance from the adit approach to the vein where struck is 170 feet, making the total length of the adit and cross-cut 423 feet. The east 300-foot level from the main shaft on the Whitney has been driven a distance of 240 feet, leaving about 500 feet remaining before connection can be made. In the main shaft—or No. 1 shaft—no sinking has been done for some time past. Its present depth is about 368 feet. Plats have been cut and a station established at a depth of 360 feet—60 feet below the 300-foot station. The former levels are progressing both ways from the shaft as rapidly as the nature of the ground will permit. The 360-foot level going east is in the same ore-chute found in the 300-foot level above, the vein-matter carrying ruby silver. Although doing development-work, the superintendent has raised, and has on hand from the workings, about 1600 tons of ore.

LAKE COUNTY.

The Leadville *Circular* approximates the daily ore output as follows:

Mines.	Tons.	Mines.	Tons.
Little Pittsburg	12	Henriette	25
Chrysolite	30	Robert E. Lee	30
Little Chief	15	Big Chief	25
Iron Mine	225	Matchless	40
Silver Cord-Wave	60	Hibernia	12
Catalpa	10	Dunkin	12
Little Ella	20	Carbonate Hill	10
Oro La Plata	50	Long & Derry	12
Glass-Pendery	20	Comstock	3
Morning Star	130	Crescent	8
Argentine	40	Big Pittsburg	12
Little Prince	12	Dyer	2
Florence	2	Etna	10
New York	6	Agassiz	10
Small Hopes	—	Leadville	10
Robert Emmet	5	A. Y.	100
Shields	8	Little Missouri	12
Brian Boru	10		
Frenchman	3	Total tons	1101
Evening Star	130		

AMIE.—The Leadville papers are enthusiastic over a reported strike in the north workings of the Amie, samples of which, according to the Leadville *Herald*, assay 1740 ounces of silver to the ton. Apparently none of the reporters of the Leadville papers have visited the underground workings of the mine, and all information regarding the strike is derived from the manager, Mr. Van Wagenen, and therefore should be taken with due allowance. Six tons of ore were selected and sent to the La Plata smelter.

BIG PITTSBURG.—The superintendent telegraphed, February 26th: Heytrossar shaft five feet low-grade ore. Lent shaft eighteen inches ore, four of which are sand carbonates. Nothing new elsewhere.

HIGHLAND CHIEF.—The Leadville *Herald* says: Since the first of November, this mine has been constantly worked. The new shaft was started about 400 feet southwest from the discovery-shaft on the property, and under contract no cessation of work has occurred. The shaft is now down to a depth of 173 feet. While this work has been progressing, the old portions of the mine have also received attention, and have yielded a profit over all expenses. In December, this profit amounted to about $2500; in January, it was from $600 to $700; and for February, while the amount is not yet known, will considerably exceed that of the month preceding. Within a few days past, a strike has been made in the old workings, at a depth of about 200 feet from the surface, the extent and value of which have not yet been determined. Three tons taken out on Saturday last are estimated worth about $300 a ton. The general product of ore from the mine is of low grade, but by concentration can be made to pay.

EVENING STAR.—The Leadville *Democrat* says: The important developments of the mine are at present carried on in the west workings, where at one time it was thought there was but little ore. The explorations, however, have proved the contrary, and now some very fine sand carbonate ore is obtained. For the purpose of getting this ore to the surface with advantage, a shaft is sinking four by eight feet in the clear, to tap the working.

LITTLE PITTSBURG.—The operations are confined to the New Discovery workings, although it is said that work will shortly be resumed in the north part of the Little Pittsburg and Winnemuc claims.

ROBERT E. LEE.—According to the Leadville *Democrat*, the breasts in the mine are looking better than ever. The ore-shipments are kept up to the average production. The grade of the ore in some places has recently somewhat improved, and the general appearance of the mine is most satisfactory. Recently, while cutting a station at the bottom of No. 6 shaft, a body of sand was struck; the opening is in 10 feet, and the prospects for getting ore in this section seem very encouraging. Assays made on the sand have returned from 12 to 14 ounces in silver, which shows a probability of richer ore-bodies in close proximity.

MONTANA.

BOSTON & MONTANA GOLD MINING COMPANY.—The secretary of this company reports officially the following: The gold bullion produced in the year 1881 was $59,294.82. Late in December, the new forty-stamp mill started up, which, in addition to ten operated in 1881, made a total number of fifty since January 1st. These fifty stamps produced in January $22,852.26. Thirty more will be in operation April 1st.

SUMMIT VALLEY DISTRICT.

We are indebted to the Butte *Miner* for the following review of mining operations for the week ended the 18th ult.:

ALICE.—Though dated November, 1881, the publication of Prof. W. P. Blake's report on this mine has been unavoidably delayed until now. Mr. Blake describes the 5th, 6th, and 7th levels in detail. He says: The two lower levels have added enormously to the reserves of the mine. They have shown the persistence of the vein in depth. Speaking of the Magna Charta and Valdemere claims (which have passed to the company by payment of $200,000 in notes for one, two, and three years), Mr. Blake states that the indications are, that the Magna Charta ore will compare favorably with the Alice ores, if it does not exceed them in richness. It is much desired at the mills to mix with the latter, as they work extremely well together. The Alice may be considered as opened far in advance of the mill capacity (20 stamps wet and 60 stamps dry), if worked to its extreme limit of production. There are large reserves upon the upper levels as yet untouched, and on all levels there are bodies of second-class ore, which will pay a satisfactory profit when the expenses of mining and working are reduced by working on a larger scale with greater economy, by the adoption of needed improvements, such as power drills and increased hoisting facilities, and a different system of pumping. It appears from the books of the company that from January 1st, 1880, to the 31st of October, 1881, there were reduced in the mills of the company 29,583 tons of ore, 26,357 tons of which were base roasting ores, the remainder being surface or free ore. The average amalgamation of the roasting or base ore was 86·35 per cent, and of the free ore 72·18 per cent. Professor Blake says that it is highly probable that great improvements may be made in the method of treating the ores so as to lessen the expenses of roasting and milling, thereby increasing the profits and adding to the amount of available ores standing. Mr. Blake recommends that, in view of the fact that so much of the ground already drained is unopened and comparatively unknown, it would be best to direct the energies of the company for a time toward the exhaustion of the upper levels, so that they may be abandoned and allowed to close up, thus avoiding the great expense of maintenance. The introduction of power drills will secure more rapid and cheaper mining, and the substitution of direct-acting and more powerful hoisting-engines and double-decked cages will give cheaper hoisting. A large amount of exploration of the vein on the several levels is needed both in driving and cross-cutting, and much of this exploratory work will be producing ore, and so partly defraying the cost. He recommends the replacement of the steam-pumps now in use by a regular Cornish mining-pump, because there would be a greater economy of fuel, greater safety of the men and mine, and relief from the heat and moisture due to the steam-pipes and the escape of steam. He urges the adoption of power drills, worked by compressed air, and is emphatic in his statement of the necessity of thoroughly surveying and mapping the mine. In conclusion, Mr. Blake says: I have every confidence in the persistence of the lode in depth, and believe that it justifies preparations for mining it to a very great depth.

From the superintendent of this company's mines and mills it is learned that in the Alice for the past week rising from all the levels has been going on much as usual. A little more than the usual quantity of ore has been extracted from the Alice stopes; that is, a little over forty tons per day. The mills are now running as usual. After a clean-up of three days, the new mill was started Friday evening. These clean-ups are made at intervals of sixty or ninety days, as required. In the west shaft of the Magna Charta, driving from the 400-foot station for the south vein has been continued, the cross-cut being about 75 feet. On the same level, the drifts east and west on the north vein are pushed steadily, and some first-class ore is hoisted. On the 300-foot level stoping is going on in all the veins. The new or east shaft in the Magna Charta is down 110 feet, and a station is cutting at that level. It is not anticipated that water will be reached until the depth of 400 or 500 feet is attained. In the west shaft, water was found at a depth of 209 feet. Ten bars of bullion from the Alice mills were shipped Friday, and ten bars will be shipped to-day, over 700 fine.

BELL.—The *Inter Mountain* says: The Bell is now producing better ore and more of it than ever before came out of the mine. On the 100, 200, and 300-foot levels, drifts on good ore are actively forwarded, and the stopes are opened up with very gratifying results. All the Bell ore is by no means of a high-grade character, but the first grade is exceedingly rich in silver and copper; the second grade, of which extensive bodies are valuable for extraction, is susceptible of easy and profitable reduction; and the third grade, of which an unlimited amount is in sight, can be made very valuable by concentration. Of the first and second-class ores, 1500 tons are at the smelter undergoing the process of desulphurization. They furnish a large proportion of their own fluxes, and run through the blast-furnaces in a way that would do the stockholders good to behold. The mine is now producing from 30 to 40 tons of first and second-class ore per day, and the furnace at present in operation reduces about 30 tons every twenty-four hours.

GAGNON.—The 300-foot station has been finished, and timbers and pumping apparatus are all prepared for the commencement of sinking. This will be begun at once, and the shaft run down to the 400-foot level. During the past several weeks, the daily output has been the same as usual, the ore varying but little from week to week in richness. A recent assay gave 80 ounces of silver and 18 per cent copper.

MOULTON.—During the past week, work has been pushed vigorously on the 200, 300, and 400-foot levels of the Moulton. The Cornish pumps are not yet in operation, as the pumping-rod is not connected nor the column in position. The pumps will be running in about a week or ten days. On the 100-foot level, only the north vein has been worked at all, so that, from the 200 up, the Moulton stoping ground is almost untouched. On the 200 level, at a point 100 feet west from the cross-cut, the three-foot body of ore already mentioned as found on the hanging-wall of the center vein continues to yield fine free-milling ore, showing native and wire silver. This has continued for twenty-five feet along the vein, the ore averaging about fifty ounces. Within the last three days, another three-foot body of base ore, containing a little zinc and a good deal of pyrites of iron, has been struck immediately south of the hanging-wall body just described. This base ore is not separated by a horse from the free-milling ore, but forms one continuous breast with it, six feet wide. It is also a little higher grade than the other, giving from 49 to 70 ounces in assay. This is the first time base ore in any quantity has been found in the Moulton. On the 400 level, a two and a half foot body of ore was struck last week in the east drift. Samples taken from the car on Friday gave 57 ounces, and from the breast 59 ounces. The rise on the 300-foot east level, next to the Alice line, is in a fine body of ore. Battery samples Friday showed forty-three ounces.

FINANCIAL.

Gold and Silver Stocks.

NEW YORK, Friday Evening, March 3.

The week under review has been a fairly active one, and prices have been rather strong. The Comstock shares have received a liberal attention in the dealings. The outlook is more encouraging than it was.

The Tuscarora stocks have been very quiet, and, as for a long time past, without special feature.

The Comstock shares have been very active, and a long list has been covered by the dealings. Prices have generally been better. California records sales of 6400 shares at 30@40c. The sales of Consolidated Virginia aggregate 9540 shares at 68@80c.

Sierra Nevada has been quite active and strong, the sales aggregating 3535 shares at $8\frac{5}{8}$@$8\frac{1}{2}$. Best & Belcher has assumed an unusually active as well as strong position; the sales amount to 3850 shares, at $5\frac{3}{4}$@7. Sutro Tunnel has been active, the sales aggregating 27,500 shares at 67@79c. Most of the other Comstock shares have been strong, although not active.

The Bodie stocks have had a moderate business at better prices for the better stocks. Bodie records sales of 1570 shares at $3@$4\frac{1}{8}$. Bulwer, with sales of 825 shares, ranged between $2.35@$2.10. Standard has been quiet at $16@$16\frac{3}{4}$.

Alice has been quiet at $2.80. Bassick sold at $5.25. Chrysolite has had a very liberal business at fairly well-maintained prices; the sales aggregate 8030 shares at $3.80@$4.20. Excelsior sold at $1.75. Green Mountain, under a moderate business, has been stronger than for a long time past; the sales amount to 4300 shares at $2.05@$2.25. Horn-Silver has been unusually active and somewhat weak; the sales aggregate 5420 shares at $14\frac{1}{8}$@$13\frac{1}{4}$. Iron Silver records a large business at well-maintained prices; the sales aggregate 19,500 shares at $1.85@$2.20. Leadville, under a moderate business, has been weak, the sales amounting to 4250 shares at 70@55c. Little Chief has been fairly active and steady. Moose, under quite an active business, advanced from 95c.@$1.20, the sales amounting to 25,700 shares. Robinson Consolidated has been exceedingly active and strong, the sales aggregating 327,630 shares at $2.95@$3.70@$3.20. Stormont sold at 75c. on Saturday, and recovered to 85c. yesterday.

Advance sold to the extent of 9600 shares at 53@55c. Barcelona, with sales of 21,800 shares, declined from 20@15c. Central Arizona, with a moderate business, ranged between 98c.@$1\frac{1}{8}$. Beginning with Tuesday, Clarence sold to the extent of 4100 shares at $1.60@$1.15. Globe Copper has been quite active and weak, the sales amounting to 20,400 shares at 70@50c. Oriental & Miller, with the usual amount of business, ranged between 20@24c. Rappahannock had a moderate business at 33@36c. Silver Cliff records sales of 8200 shares at $2@$2.20. South Pacific has been active and weak, the sales amounting to 82,500 shares at $3.20@$2.50. State Line, Nos. 1 and 4, have been quiet at 19@13c.; Nos. 2 and 3 have been quite active, the sales aggregating 159,570 shares at 65@74c. Taylor-Plumas records sales of 24,500 shares at $1@55c.

DIVIDENDS.

The Bulwer Consolidated Mining Company has declared its fourth monthly dividend of 10 cents per share, payable March 13th, at the Farmers' Loan and Trust Company.

The Consolidated Gold Mining Company, Georgia, has declared a dividend (No. 10) of 4 cents per share, payable February 24th. Total dividends to date, $40,000.

The Contention Mining Company, of Arizona, has declared a dividend of 25 cents per share.

The Gunnison Improvement Company, of Colorado, has declared a dividend of 10 cents per share, payable at the transfer-office of the company, 202 Walnut street, Philadelphia, on and after March 1st, to the stockholders then of record. Transfer-books closed February 25th.

The Standard Consolidated Mining Company has declared its usual monthly dividend of 75 cents per share, payable March 13th. Transfer-books close March 4th.

The Tombstone Mill and Mining Company has declared its regular monthly dividend of $50,000, being 10 cents per share, payable March 15th. Transfer-books close March 9th.

The Evening Star Mining Company has declared a dividend (No. 34) of 5 per cent on the capital stock. Also a dividend (No. 35) of the same amount, payable March 8th. Transfer-books close on the 4th.

UNLISTED QUOTATIONS.

Mr. L. V. Deforeest, No. 70 Broadway, under date of March 3d, 3 P.M., reports the current quotations of unlisted stocks as follows:

	Bid.	Off'd.		Bid.	Off'd.
Colum. & Beaver.		$0.55	Highland Chief.		$1.60
Eagle.....		1.10	Hite		1.50
Hall.....	$1.50	3.00	Menlo....		1.20
Harlem.....	1.10	1.30	Satemo.....		1.00

REVIEW OF THE SAN FRANCISCO MARKET.

The San Francisco stocks, particularly the north end Comstocks, have, in a measure, recovered from the recent dullness, and assumed an appearance of strength which had not been noticed for some time. There are whisperings of another important development in one of the north end mines that will send prices way up; but with the experience gained from previous "important developments," it is improbable that the market will respond readily to rumors of strikes. Heretofore, whenever any favorable-looking quartz has been struck, the find has been magnified by the insiders to a new bonanza, and prices are pushed up to an extremely high figure, only to fall back lower than ever under the weight of numer-

ous assessments. Many of the south end stocks are weak, owing to the body of water struck in the Exchequer, which has flooded Yellow Jacket and Overman, necessitating the stoppage of work on these mines.

SAN FRANCISCO MINING STOCK QUOTATIONS.
Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS. Feb. 24.	Feb. 25.	Feb. 27.	Feb. 28.	Mar. 1.	Mar. 2.
Alpha	29-32	1⅛	1¼	1⅜	1¼	1¼
Alta	3	3⅛	3¼	3⅛	3	3
Bechtel						
Belcher	13-32	11-32	21-32	13-32	13-32	11-32
Best & Bel	5⅝	5⅞	6⅝	6¾	6¼	6⅝
Bodie	3	3⅛	3¾	3⅞	3⅞	4
Bullion	11-16	11-16	1⅛	1	29-32	27-32
Bulwer				2⅜		
California	3-16	5-16	5-16	11-32	11-32	11-32
Challar	29-32	1	1⅛	1¼		1¼
Con. Va	¼	11-32	7-16	7-16	13-32	13-32
Crown P'int	11-32	11-32	19-32	7-16	13-32	13-32
Eureka Con	13		12½	13	12⅞	12¾
Exchequer	7-16	½	11-16	9-16	½	19-32
Gould &Cur	2⅞	3	3⅜	3⅛	3¼	3¼
Hale & Nor	1⅜	1⅝	1½	1½	1⅜	1½
Manhattan	1½		1½	1⅜	1½	
Mar. White	6	5¾	6¼	5½		6¾
Mexican	8¾	9⅛	9⅛	9¼	9	9⅜
Mono	15-16	1⅛	1¼	1½	1¼	1¼
Mt. Diablo				6⅜	6⅜	6⅜
Navajo					11-32	
North. Belle	9½	9⅞	10½	10¼	9¾	9¾
Noonday	3-16	3-16	¼		¼	
Ophir	6¾	3⅞	4⅜	4⅜	4⅜	4½
Oro	¼	¼	¼	¼	11-32	7-16
Overman	7-16	½	9-16	7-13	9-16	½
Potosi	27-32	15-16	1⅛	1	1	1⅛
Savage	1¼	1⅜	1½	1⅜	1⅜	1⅜
Scorpion	21-32	21-32	1	13-16	27-32	29-32
Sierra Nev	6¾	6⅞	8	8½	7⅝	7⅞
Silver King	18½		18¼		18½	
Tip Top	4¼		4¼			
Union Con	9¾		11⅝	11⅛	10⅞	11⅛
Wales Con	9-16		9-16		9-16	19-32
Yel. Jacket	¾	¾	15-16	11-16	11-16	11-16

Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

BOSTON, March 2.

There is a decidedly better tone in the market for copper stocks this past week, and, although the volume of business has been light, prices are better, and a more hopeful feeling is manifested. The transactions are, however, confined largely to the dividend-paying mines, or those which are soon to become such, while there is absolutely nothing doing in the speculative list. Silver stocks continue dull and inactive, and prices show no material change. Calumet & Hecla advanced from $231 @$235, and closed at $236 bid, $237 asked. Quincy has been in good demand, and advanced from $42@$46, closing at $46 bid. Osceola also advanced from $30@$32, and is wanted at that price. Atlantic is inquired for at an advance of ½ over last week's price, with sales at $14. Pewable advanced from $12¼@$13. Franklin advanced from $11@$11½; but was lower today, and sold at $10¾, closing, however, at that bid. National sold at $2½; Huron, at $2¼; Phœnix, at $3; and Allouez, at $2¾@$3. Douglass declined to 31¼c.; and Brunswick Antimony declined from $14@$12, and advanced to $13.

In silver stocks, Bonanza Development was steady at $4½; and Catalpa, 55@62½c. San Pedro advanced from 52½@65c. Harshaw is quoted $3 1-16@$3⅛. Sullivan declined from $2@$1¾. Napa Quicksilver was steady at $6½.

At the Boston Mining and Stock Exchange, business the past week has been very light and without any special feature. Milton declined to 8c., but rallied to 12c., with sales of about 20,000 shares. Cumberland advanced from 70@72c. regular, and to 75c., buyer 30; Empire, sales from 44@48c., closing 45c; Massachusetts & New Mexico, at 21@23c.; Deer Isle, at 18@20c. War Eagle declined to 60c.

3 P.M.—The market this afternoon was fairly steady, with sales of Quincy at $46; Calumet & Hecla, $233½ bid, $237 asked. Osceola sold at $32; Franklin, $10¾ bid; Pewabic, $12¼ bid; Silver Islet, $18¼@$19¼; after the Board, there was a brisk inquiry for the stock, and sales are reported at $20, which was also bid for it; Osceola, $31¼ bid; Atlantic, $13½@$14; Harshaw, $3¼@$3½; Huron, $2¼@$2½; National, $2 1-16 bid; Sullivan, sales at $1⅝; closing, $1⅝@$1¾.

Coal Stocks.

NEW YORK, Friday Evening, March 3.

A fair business has been done in these stocks during the past week at generally lower prices. Delaware, Lackawanna & Western sold from $126@$123½, closing at $124; the sales amount to 94,879 shares. Delaware & Hudson records sales of 13,445 shares at $108¼@$106½. New Jersey Central, on sales of 64,775 shares, declined from $97@$90¼. Reading, with sales in this market of 40,150 shares, fluctuated between $60⅝ and $56¾.

BULLION MARKET.

NEW YORK, Friday Evening, March 3.

DATE.	London Pence.	N. Y. Cents.	DATE.	London Pence.	N. Y. Cents.
Feb. 25	52	114⅛	March 1	52	114⅛
Feb. 27	52	114⅛	March 2	52	114⅛
Feb. 28	52	114⅛	March 3	52	114⅛

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	SHARES. No. in 1000's	SHARES. Par Value.	ASSESSMENTS. Levied to date in 1000's.	ASSESSMENTS. Date and amount per share of last.	DIVIDENDS. Total paid to date in 1000's.	DIVIDENDS. Date and amount per share.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE. Feb. 25. H.	Feb. 25. L.	Feb. 27. H.	Feb. 27. L.	Feb. 28. H.	Feb. 28. L.	March 1. H.	March 1. L.	March 2. H.	March 2. L.	March 3. H.	March 3. L.
Alice, Mon	400	25	*		400	De 81 10			2.80						2.80		2.80	
Amie Con., Co	500	10	*		305	My 80 10	.25	.23	.27	.24	.27	.25	.26	.25	.26	.25	.26	.23
Argenta, Ne	100	100	140	Se 81 10	40	Fe 80 20												
Bar & Walker, Ut	100	10	*		60	No 80 10												
Bassick, Co	100	100	*		25	Fe 80 25												
Belle Isle, Ne	100	100	55	Se 81 10	300	De 79 25			5.25									
Black Bear, Ca	90	100	15	Se 79 50	830	De 81 20					.15							
Bonanza, Ne	104	100	2380	Se 81 1 00	15397	Ap 76 75												
Bodie Cons., Ca	100	100	125	De 81 50	1200	Mr 80 25	3.00				4.00		4.00	3.88	4.00	3.75	4.13	4.00
Breece, Co	200	25	*		2	Fe 80 1												
Bulwer Ca	100	100	30	De 77 50	30	Fe 82 10	2.15		2.35		2.35	2.25					2.10	
California, Ne	540	100	270	Ja 82 20	31320	De 79 50	.30	.12	.35	.32	.32	.30	.38	.35	.37	.35	.40	
Cal. & Hecla, Mich	100	25			20350	No 81 5 00												
Caribou Con., Co	100	10	*		50	Mr 80 10												
Catalpa, Co	300	10	*		180	My 81 20												
Chrysolite, Co	200	50	*		1650	De 81 50	4.10	3.80	3.90		4.15	4.00	4.20	4.00				
Climax, Co	200	10	*		180	Au 80 30			.36		.56		.35	.30	.32	.30	.32	.30
Cons. Va., Ne	540	100	735	Ja 82 30	42030	Au 80 50	.68	.25	.70	.68	.76	.45	.80	.45	.79	.40	.80	.42
Copper K'b, N.C	1000	1	*		15	No 80 02	.03	.02	.02				.02		.02		.02	
Copper Queen, Ar	250	10	*		250	Ma 82 20												
Crown Point, Ne	100	100	2573	Se 81 75	11588	Ja 75 20												
Dudwid-Terra, Dk	200	25	*		4325	Fe 82 15												
Dunkin, Co	200	25	*		200	Ju 81 75			.54	.53	.52		.50				.52	
Eureka Cons., Ne	50	100	100	My 76 1 00	4730	Se 81 50	12.50											
Evening Star	50	10			650	Ja 82 1 00												
Excelsior, Ca	100	100	330	Ja 82 1 00	850	Se 80 25									1.75		1.75	
Exchange, Ne	100	10	*		15	03												
Fa. de Smet, Dk	100	100			300	Fe 82 25												
Findley, Ca	200	1	*		8	My 79 10												
Freeland, Co	200	25	*		50	My 81 25												
Gem, Co					4	De 81												
Glass-Pend., Co	250	20	*		25	My 81 10												
Gold Stripe, Ca	150	10	*		70	Jy 81 15											.54	.30
Gld & Curry, Ne	108	100	3308	Ja 82 50	3825	Oc 79 80									3.50			
Grand Prize, Ne	100	100	340	Oc 81 25	450	Se 80 25												
Great Eastern, Dk	300	1	*		16	Jy 8 01					.08		.08	.07	.08			
Gr. Mountain, Ca	125	10	*		212	No 81 7½	2.15		2.05		2.10		2.10		2.25	2.15	2.10	
Hale & Nor., Ne	112	100	3838	De 81 75	1638	Ap 71												
Hibernia, Co	300	25	*		150	Jy 81 10	.18	.16	.17		.18	.16	.17	.16	.17	.15	.15	
Homestake, Dk	100	100	200	Ap 78 1 00	1260	Fe 82 30												
Horn-Silver, Ut	400	25	*		800	Fe 82 75	14.50	13.88	14.50	14.00	14.50	14.00	14.25	14.00	14.13	14.00	14.00	13.50
Hukill, Co	200	5	*		210	De 78 10			.65		.65	.60	.63	.62	.60	.59	.59	
Idaho, Ca	3100	100			312	Ja 82 7 50												
Independence, Ne	100	100	170	Au 81 15	225	Se 79 25	.10						.10		.09			
Iron Queen, Ne	125	2		Fe 80 15	28	Se 81 05												
Inyo, Ca	100	5	*		40	De 81 05												
Iron Silver, Co	100	20	*		500	De 81 20	2.10		2.10	1.85	2.15	2.05	2.20	2.10	2.15		2.20	2.10
Jocuistita, Mex	100	100			200	Fe 82 1 50												
La Plata, Co	200	10	*		450	Fe 82 10												
Leadville C., Co	400	10	*		170	De 81 05	.70	.64	.63	.63	.62	.55	.60		.60		.60	.58
Leeds, Ut	60	100	51	Je 81 25	78	Oc 78 15												
Little Chief, Co	200	50	*		700	Au 80 50	1.00	.96	1.00		1.05	.99	1.00	.59	.98	.97	1.00	.99
Little Pittsburg, Co	200	100	*		1350	Mr 80 50			1.50				1.55	1.38	1.50			
Martin White, Ne	100	100	900	Ja 82 25	90	Jy 79 50												
Moose, Co	200	10	4		550	Mr 78 25			.97	.96	1.05	.95	1.20	1.00	1.20	1.15	1.15	
Navajo, Ne	100	100	200	De 81 15	25	Mr 81 25			.30						.35		.35	
N. Y. & Colo., Col	50	20	*		25	Jy 79 10												
N'th'n Belle, Ne	50	100			2088	De 81 75	9.25				11.00				9.75		10.25	9.75
N. Belle Isle, Ne	100	100	25	Fe 80 15	30	Au 81 15												
Ontario, Ut	150	100			4325	Ja 82 50									35.00			
Ophir, Ne	100	100	3.92	Mr 81 1 00	1603	Ja 81 1 00	7.50	4.00	4.00				5.00	4.75	4.75		4.63	
Osceola, Mich	50	25			610	Oc 81 1 50												
Plumas, Ca	100	10	*		151	Jy 79 8												
Quicks. Pref., Ca	43	100			396	Au 81 9 25	50½	59.00	60.00				60.00					
" Com., Ca	57	100			128	Au 81 2 25			11.25	11.13	12.50				12.50			
Quincy, Mich	40	25			3020	Fe 82 8 00												
Rising Sun, Ca	150	5	*		52	My 81 75	.45	.35			.38	.33	.40	.37	.40		.43	.40
Robinson C., Co	200	50	*		575	No 81 50	3.38	2.95	3.60	3.30	3.70	3.25	3.70	3.55	3.65	3.35	3.65	3.20
Robt. E. Lee, Co	500	500			50	Jy 81 10												
Savage, Ne	112	100	3496	Ja 82 50	4480	Ju 69 3 00	1.10											
Sierra Nev., Ne	100	100	4850	De 81 1 00	102	Ja 71 1 00	6.25	5.75	6.50	6.25	8.25	7.25	8.50	8.25	8.13		8.38	7.88
Silver King, Ar	100	100			800	De 81 25							17.75					
Silver King, Co	500	2			50	Au 81 10												
Spr'g Valley, Ca	200	1	*		50	Ja 81 25												
Standard, Ca	100	100	50	Jy 78 1 00	8375	Ja 82 75	16.00		16.00				16.75	16.50	16.50	16.25		
Starr-Grove, Ne	200	10	*		10	Ju 81 10			1.25									
Stormont, Ut	200	1	*		155	No 81 05	.75				.95		.90					
St. Joseph, Mo	100	10	*		200	De 81 20												
Tip Top, Ar	100	100	120	Mr 80	100	No 81 20												
Tombstone, Ar	500	25	*		1100	Ja 82 10												
Vizina, Ar	200	25			80	De 81 10	2.75	2.65	2.75	2.65	2.70		2.75	2.70	2.75	2.60	2.80	2.60
Yel. Jacket, Ne	120	100	4150	Oc 81 1 00	2184	Au 71 2 50									2.0			

SALES.—Alice, 900; Amie Consolidated, 68,800; Bassick, 100; Belle Isle, 400; Bodie Consolidated, 1570; Bulwer, 825; California, 6400; Chrysolite, 8030; Climax, 3200; Consolidated Virginia, 9540; Copper Knob, 25,000; Dunkin, 3600; Eureka, 100; Excelsior, 300; Gold Stripe, 800; Gould & Curry, 100; Great Eastern, 2800; Green Mountain, 4300; Hibernia, 9400; Horn-Silver, 5420; Hukill, 2300; Independence, 500; Iron Silver, 19,500; Leadville, 4250; Little Chief, 9950; Little Pittsburg, 650; Moose, 2,5700; Navajo, 400; Northern Belle, 820; Ontario, 300; Ophir, 860; Plumas, 100; Quicksilver, preferred, 600; common, 735; Rising Sun, 6600; Robinson Consolidated, 327,630; Savage, 600; Sierra Nevada, 3535; Silver King, 100; Spring Valley, 100; Standard, 685; Starr-Grove, 200; Stormont, 905; Vizina, 2170; Yellow Jacket, 25. Dividend shares sold, 560,800.

Bullion Receipts at New York.—The bullion received from the mines at the various offices in this city during the week ended March 3d, as compiled from various sources, amounted to $313,000, as against $245,000 reported for the previous week. The receipts from January 1st, 1882, to date are $2,757,353.13.

Foreign Bank Statements.—The Governors of the Bank of England at their weekly meeting made no change in the minimum rate for discount, and it remains at 5 per cent. During the week, this bank gained £581,000 bullion (principally from America), but the proportion of its reserve to its liabilities was reduced from 38 9-16 to 37 11-16 per cent, against 46 3-16 at the same date last year. The Bank of France reduced its rate for discount to 4 per cent, and its weekly statement shows a gain in specie of 6,475,000 francs gold, and 1,075,000 silver.

Exports of Gold and Silver from New York.

Week ended February 25th	$1,709,563.00
Corresponding week last year	175,510.00
Since January 1st, 1882	8,792,741.00
Corresponding period last year	1,903,710.00

United States Assay Office.—Statement of business at the United States Assay Office at New York for the month ended February 28th, 1882:

Deposits of gold	$935,600.00
" silver	520,400.00
Total deposits	$1,456,000.00
Gold bars stamped	$519,026 41
Silver " "	644,872.87
	$1,163,899.28

United States Mints.—The following is a statement of the coinage executed at the mints of the United States during the month of February, 1882:

Denomination.	Pieces.	Value.
Double-eagles	3,325	$66,500.00
Eagles	210,025	2,100,250.00
Half-eagles	901,435	4,507,125.00
Three dollars	25	75 00
Quarter-eagles	25	62.50
Dollars	25	25.00
Total gold	1,114,850	$6,674,037.50
Standard dollars	2,300,200	2,300,200.00
Half-dollars	200	100.00
Quarter-dollars	200	50.00
Dimes	200	20.00
Total silver	2,300,800	$2,300.370.00
Five cents	800,700	40,035.00
Three cents	700	21.00
One cent	3,540,700	35,407.00
Total minor	4,342,100	$75,463.00
Total coinage	7,757,750	$9,049,870.50

Import and Export Statistics.—The Chief of the Bureau of Statistics, in his seventh monthly statement for the current fiscal year of the imports and exports of the United States, says: The excess of imports or of exports of gold and silver coin and bullion was as follows:

Month ended January 31st, 1882 (excess of exports)	$617,290
Month ended January 31st, 1881 (excess of imports)	4,282,943
Twelve months ended January 31st, 1882 (excess of imports)	44,427,215
Twelve months ended January 31st, 1881 (excess of imports)	73,347,200

BULLION PRODUCTION FOR 1882.

We give below a statement showing the latest bullion shipments. These are officially obtained from the companies, where that is possible; and where official statements can not be procured, we take the latest shipments published in those papers nearest to the mines reported. The table gives the amount shipped for the week up to the date given, as well as the aggregate shipments to such date, from the first of January, 1882.

The shipments of silver bullion are valued at $1.29·29 per ounce, Troy; gold at the standard $20.67 per ounce, Troy. The actual value of the silver in the following table is therefore subject to a discount, depending on the market price of silver. If the price of silver be counted at $1.12 per ounce, which has for some months been about its average value, the following figures, where they relate to silver bullion, should be diminished by about 13½ per cent to arrive at actual value.

MINES.	State.	For the week.	Month of February.	Year from Jan. 1st, 1882.
Alta-Montana, G.	Mont.	.....	$22,000	$34,200
Barbee & Walker, S.	Utah.	3,092	9,059	21,531
Bodie, G.	Cal.	.....	17,030	47,910
*Boston & Montana	Mont.	.....	.....	22,852
Caledonia, G.	Dak.	8,017	8,017	30,570
*†Chrysolite, S.	Colo.	.....	.....	41,805
*Contention, G. S.	Ariz.	.....	.....	121,886
Crismon-Mammoth, G.	Utah.	.....	2,100	3,880
*Custer, G. S.	Idaho.	.....	16,347	44,168
*Deadwood-Terra, G.	Dak.	.....	.....	61,880
Eureka Con., G. S. L.	Nev.	16,720	52,420	114,920
*Grand Central	Ariz.	.....	.....	100,000
*Head Center, S.	"	.....	.....	14,830
*Homestake, G.	Dak.	.....	.....	107,491
Horn-Silver, S. L.	Utah.	72,500	260,500	574,850
Idaho, G.	Cal.	.....	.....	75,000
*Indian Queen, S.	Nev.	.....	.....	18,153
Inyo Cons., G.	Cal.	.....	37,000	77,000
Leeds, S.	Utah.	.....	800	5,750
Manhattan, S.	Nev.	.....	.....	64,300
Mount Diablo, S.	"	15,296	32,596	32,596
Noonday, G.	Cal.	.....	5,760	18,610
Northern Belle, S.	Nev.	14,761	48,151	99,621
North Noonday, G.	"	.....	6,200	17,200
*Ontario, S. L.	Utah.	.....	80,862	‡304,607
Ophir, G. S.	Nev.	.....	12,000	12,000
Pascoe, S.	Utah.	.....	.....	4,575
Silver King, S.	Ariz.	.....	.....	41,000
Standard, G.	Cal.	15,513	49,783	195,083
Star, G.	Nev.	.....	3,200	12,100
Stormont, S.	Utah.	11,075	29,778	43,734
Syndicate, G.	Cal.	.....	.....	8,000
Tintic M. and M. Co.	"	2,001	9,004	11,929
*Tip Top, S.	Ariz.	.....	.....	41,915
*Tombstone, G. S.	"	.....	.....	‡150,478
Vizina, S.	"	.....	.....	31,000
Total amount of shipments				$2,607.454

*Official. †Net. G. Gold. S. Silver. L. Lead. ‡Assay value.

METALS.

NEW YORK, Friday Evening, March 3.

So far as the weather has an influence, through the building trades, for instance, of shaping the consumption of metals, it is tending to bring on an early spring trade, and is even now distinctly influencing the demand. Notwithstanding an unusually heavy consumption, however, the markets here are temporarily dull throughout.

Copper.—Though many of the long contracts made months ago are expiring, and the time is approaching when manufacturers must come forward for new supplies, nothing has been done. Consumers, evidently under the impression that they can obtain concessions, are holding off, and prefer to use every scrap of raw metal in their works rather than purchase now. The mining companies, on the other hand, profess to be confident of obtaining a round price, and are maintaining a firm attitude. From the annual reports of many of them, it is evident that they have carried little metal over into the new year, there being but one exception to this in the case of one mine, which held about 2,000,000 pounds. How long the present state of affairs will last, it is, of course, impossible to foreshadow; it may, however, continue for weeks. It should not be forgotten, however, that business is good, stocks moderate, and that it is not in the interest of manufacturers who have stocks of finished products to see any serious decline in copper. They apparently ask only that reasonable concessions be made, which the decline in the English market seems to warrant. Since our last, there have been small sales at 19⅛@19¼c., 19½c. being asked at the close. The latest English quotations at hand by cable give £65 for Chili Bars.

From Messrs. James & Shakespeare's daily reports we take the following:

On the 13th ult., there was a slight improvement, owing to the small quantity of metal chartered during the first half of February. It is difficult to account for the importance attached to these advices, which, taken individually, form no index whatsoever of the actual production of the country. The telegrams received to-day report 900 tons for Europe, all bars, of which 450 tons for England and 450 tons for France. On the 14th, this improvement was lost.

Our latest mail advices of the 17th report a better feeling, with business sharp cash at £63⅝, and £63½ net, and £63⅛@£64⅛ fourteen days, with the usual allowances.

NON-DIVIDEND PAYING MINES.

NAME AND LOCATION OF COMPANY.		NUMBER OF SHARES.	Par.	ASSESSMENTS. Total levied to date.	ASSESSMENTS. Date and amount of last.		HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE. Feb. 25. H.	Feb. 25. L.	Feb. 27. H.	Feb. 27. L.	Feb. 28. H.	Feb. 28. L.	March 1. H.	March 1. L.	March 2. H.	March 2. L.	March 3. H.	March 3. L.
Advan'e M.&M.Co		.....	.....	.....	.....		55c	53c	55c	53c	55c	54c	55c	54c	55c	53c	55c	54c
Albion, S. L.	Nev.	150,000	100	330	Nov. 81	30	1.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Allouez	Mich	.....	.....	.....	.....		3.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alpha		.....	.....	.....	.....		1.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alta	Nev.	100,800	100	1,584,000	Dec. 81	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alta-Montana, G.	Mon.	500,000	10	*	.....		1.70	1.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. Flag, S.	Colo	125,000	10	*	.....		.....	.....	95	.....	.....	.....	.....	.....	.....	.....	.....	.....
Atlantic Copper		.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bald Mountain, G.	Colo	1,000,000	10	*	.....		20c	17c	20c	18c	19c	18c	18c	17c	18c	15c	17c	15c
Barcelona, G.	Nev	200,000	25	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Battle Creek	Dak.	200,000	25	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bear Creek	Colo	30,000	1	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Beauce G'd M.M.C		.....	.....	.....	.....		1.30	1.20	1.35	1.25	1.35	1.30	.....	.....	1.40	1.35	.....	.....
Bechtel Con., G.	Cal.	100,000	100	162,750	Dec. 81	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & B'cher, G. S	Nev.	100,800	100	1,053,700	Jan. 82	50	5.75	.....	6.13	6.00	6.75	6.88	7.00	6 6	6.63	.....	6 75	6.88
Big Pittsburg, S. L	Colo	200,000	100	*	.....		1.00	.....	1.00	.....	97c	95c	.....	.....	.....	.....	.....	.....
Black Jack, G.	Cal.	100,000	2½	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bonanza Chief	Mon	1,000,000	1	*	.....		5c	.....	5c	.....	5c	.....	5c	.....	.....	.....	.....	.....
Bondholder	Colo	200,000	2½	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston Con., G.	Cal.	100,000	100	50,000	Sept. 81	20	31c	28c	.....	.....	.....	.....	30c	28c	29c	20c	.....	.....
Boulder Con., S.	Colo	200,000	10	.....	.....		6c	.....	.....	.....	3c	.....	.....	.....	3c	.....	.....	.....
Bradshaw, S.	Ariz	225,000	10	.....	.....		41c	40c	37c	.....	41c	37c	38c	37c	40c	37c	38c	36c
Buckeye	Colo	100,000	5	*	.....		.....	.....	4c	.....	.....	.....	3c	.....	.....	.....	.....	.....
Bull-Domingo, S. L	Colo	200,000	50	*	.....		25c	.....	.....	.....	.....	.....	.....	.....	28c	.....	28c	.....
Bullion, G. S.	Nev.	100,000	100	3,892,000	Jan. 82	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bye and Bye	Ariz	100,000	10	*	.....		6c	5c	6c	.....	.....	.....	7c	.....	.....	.....	8c	.....
Calaveras, G.	Cal.	500,000	1	*	.....		11c	.....	.....	.....	.....	.....	.....	.....	.....	.....	10c	.....
C'lav'r's W.&M.Co	Cal.	.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cal., B. H., G.	Dak.	100,000	100	400,000	Mar. 81	25	1.00	.....	1.00	.....	.....	.....	1.05	.....	1.10	.....	1 20	.....
Carbonate Hill, S. L	Colo	400,000	10	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25c	.....
Catskill, S.	Nev.	300,000	5	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central Ariz'na, S	Ariz	100,000	100	.....	.....		1.05	1.00	1.13	1.05	1.05	95c	1.00	98c	1.00	.....	1.00	.....
Chapparal	Cal.	.....	.....	.....	.....		5c	.....	3c	.....	.....	.....	5c	2c	3c	.....	3c	.....
Cherokee, G.	Cal.	150,000	10	.....	.....		40c	38c	.....	.....	38c	.....	37c	.....	.....	.....	.....	.....
Cheyenne Con., G	Dak.	300,000	1	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clarence	Can.	.....	.....	.....	.....		.....	.....	.....	.....	1.50	1.25	1.60	1.50	1.45	1.35	1.2	1.15
Colorado Cent'l, S	Colo	300,000	10	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col'mb'a Con., G. S	Nev.	100,000	50	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cons. Imp'ri'l, G. S	Nev.	500,000	100	1,425,000	Jan. 82	10	7c	.....	8c	.....	.....	.....	9c	.....	8c	.....	.....	.....
Con. Pacific, G.	Cal.	60,000	100	114,000	Jly 81	40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pay Rock, S	Colo	250,000	1	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crescent, S. L.	Colo	300,000	10	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crowell, G.	N. C.	50,000	1	.....	.....		7c	.....	.....	.....	.....	.....	8c	7c	20c	13c	11c	10c
Dahlonega, G.	Ga.	250,000	1	*	.....		5c	.....	5c	.....	5c	.....	7c	6c	5c	.....	6c	5c
Dardanelles, G.	Cal.	100,000	10	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunderberg, S.	Colo	150,000	10	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Durango, G.	Dak.	500,000	1	*	.....		34c	33c	36c	33c	35c	34c	37c	35c	35c	.....	36c	.....
Empire, S.	Ut'h	100,000	100	.....	.....		.....	.....	.....	.....	1.85	1.75	1.75	.....	1.75	.....	1.75	.....
Enterprise	Colo	.....	.....	.....	.....		.....	.....	.....	.....	81c	1.75	.....	.....	84c	82c	79c	77c
Exchequer	Nev.	100,000	100	655,000	Jan. 82	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Globe Copper	Ariz.	.....	.....	.....	.....		68c	63c	69c	57c	66c	59c	70c	55c	59c	54c	54c	50c
Glynn Dale Con. G	Cal.	100,000	100	75,000	Jan. 81	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Placer, G.	Colo	200,000	25	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Goodshaw, G.	Cal.	100,000	100	145,000	Feb. 81	15	.....	.....	37c	.....	.....	.....	35c	34c	35c	32c	.....	.....
Granville, G.	N. C.	800,000	1	*	.....		.....	.....	.....	.....	3c	.....	3c	.....	.....	.....	.....	.....
Hanshaw, S.	Ariz	100,000	100	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Head Center, S.	Ariz	100,000	100	55,000	May 81	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hortense, S.	Colo	200,000	10	.....	.....		.....	.....	25c	.....	.....	.....	.....	.....	26c	.....	.....	.....
Index	Cal.	.....	.....	.....	.....		.....	.....	.....	.....	5 c	.....	.....	.....	51c	.....	48c	.....
Julia, G. S.	Nev.	110,000	100	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kossuth, G. S.	Nev.	108,000	100	.....	Jan. 82	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lacrosse, G.	Colo	100,000	10	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Legal Tender, S. L.	Colo	200,000	5	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leviathan, S.	Nev	100,000	100	350,000	Mar. 81	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lucerne, S.	Colo	500,000	10	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malachite	Nev.	200,000	5	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mariposa Pref., G	Cal.	50,000	100	1,437,500	Dec. 81	..	50c	44c	74c	60c	80c	.....	70c	60c	.....	.....	.....	.....
" Com., G	Cal.	100,000	100	1,450,000	Dec. 81	..	42c	.....	50c	.....	75c	70c	55c	.....	.....	.....	.....	.....
May Belle, G.	Cal.	100,000	100	126,000	Dec. 81	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mayflower, S.	Colo	100,000	100	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexican, G. S.	Nev.	100,800	100	1,600,800	Sept. 81	81	9.00	.....	9.25	.....	9.25	.....	9.25	.....	9.00	.....	9.50	9.25
Michoacan Synd.	Mex.	.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mineral Creek, S.	Ariz	200,000	10	*	.....		4c	3c	.....	.....	3c	.....	3c	.....	3c	.....	4c	3c
Miner Boy, G. S. L.	Colo	500,000	10	*	.....		9c	8c	9c	8c	9c	8c	9c	.....	9c	.....	9c	.....
Miller	Nev.	200,000	25	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mono, G.	Cal.	50,000	100	400,000	Dec. 81	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moose Silver, S.	Colo	300,000	10	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nevada Syndi.		.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Standard, G	Cal.	100,000	100	.....	Nov. 81	10	30c	28c	25c	.....	25c	24c	.....	.....	25c	.....	.....	.....
North State	N. C.	400,000	25	.....	.....		10c	9c	9c	8c	.....	.....	9c	.....	.....	.....	.....	.....
N. Horn-Silv'r, S. L	Utah	400,000	10	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Noonday	Cal.	60,000	100	.....	Jne 81	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Old Dominion, C.	Ariz	200,000	10	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oriental	Nev.	200,000	25	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ori'nt'l & Miller, S	Nev.	400,000	25	.....	.....		22c	20c	23c	21c	24c	20c	24c	21c	23c	22c	23c	22c
Overman, G. S.	Nev.	115,200	100	3,458,300	Jan. 82	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Potosi		.....	.....	.....	.....		70c	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quartz Creek		.....	.....	.....	.....		32c	23c	.....	.....	.....	.....	.....	.....	.....	.....	21c	.....
Rappahannock, G	Va.	250,000	1	*	.....		33c	.....	36c	35c	34c	33c	36c	34c	34c	.....	35c	.....
Red Elephant, S.	Colo	500,000	10	*	.....		17c	.....	.....	.....	.....	.....	.....	.....	15c	.....	.....	.....
San Pedro, G. S L.	N. M	400,000	25	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Cliff, S.	Colo	200,000	50	*	.....		2.05	2.00	2.15	.....	2.10	.....	2.15	2.05	2.15	2.00	2.20	.....
Silver Islet	Can.	.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Nugget, S.	Ariz	200,000	10	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silv'r N, n'w stk, S	Ariz	250,000	10	*	.....		8c	.....	8c	7c	8c	7c	8c	7c	7c	6c	8c	7c
Sonora Con.	Mex.	.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Bodie, G.	Cal.	100,000	100	85,000	Nov. 80	25	.....	.....	.....	.....	.....	.....	12c	.....	.....	.....	.....	.....
South Bulwer, G.	Cal.	100,000	100	195,000	May 81	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Hite	Cal.	100,000	5	.....	Jan. 82	10	16c	15c	.....	.....	15c	.....	.....	.....	.....	.....	14c	.....
South Pacific	Cal.	.....	1	.....	.....		3.20	2.50	3.00	2.50	3.10	2.55	2.70	2.50	2.75	2.50	2.70	2.50
State Line No. 1, S	Nev.	200,000	25	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	12c	.....	.....	.....
" No. 2, S.	Nev.	200,000	25	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" No. 3, S.	Nev.	200,000	25	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" No. 4, S.	Nev.	200,000	25	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	22c	.....	.....	.....
" Nos. 1 & 4, S	Nev.	.....	.....	.....	.....		17c	.....	19c	17c	18c	16c	18c	13c	18c	17c	18c	17c
" Nos. 2 & 3, S	Nev.	.....	.....	.....	.....		74c	70c	74c	69c	72c	66c	68c	64c	74c	65c	74c	69c
Sutro Tunnel	Nev.	2,000,000	10	*	.....		71c	67c	72c	67c	77c	72c	75c	73c	75c	74c	79c	75c
Tabor Mine	Colo	250,000	20	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Taylor Plumas		.....	.....	.....	.....		80c	70c	1.00	75c	90c	70c	95c	83c	1.00	84c	1.00	55c
Tioga, G.	Cal.	100,000	100	260,000	Jan. 82	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tuscarora, S.	Nev.	100,000	100	95,000	Apr. 81	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unadilla, S.	Colo	500,000	1	*	.....		11c	.....	12c	11c	13c	12c	12c	.....	12c	.....	12c	.....
Union Cons, G. S.	Nev.	100,000	100	1,160,000	Jly 81	81	.....	.....	11.00	10.00	11.75	11.25	.....	.....	11.38	.....	11.75	.....
Utah	Nev.	20,000	100	1,210,000	Jan. 82	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vandewater, S.	Nev.	200,000	10	*	.....		.....	.....	34c	33c	.....	.....	31c	.....	.....	.....	31c	30c
Washington, S.	Ariz.	200,000	5	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Willshire, G.	Cal.	50,000	1	*	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

SALES.—Advance M. & M. Co., 9600; Albion, 200; Allouez, 100; Alpha, 100; Alta-Montana, 500; American Flag, 200; Barcelona, 21,800; Beauce Gold M. & M. Co., 4100; Best & Belcher, 3850; Big Pittsburg, 1500; Bonanza Chief, 2500; Boston Consolidated, 15,900; Boulder Consolidated, 2000; Bradshaw, 7500; Buckeye, 200; Bull-Domingo, 800; Bye and Bye, 3500; Calaveras, 1200; Cal., B. H., 900; Carbonate Hill, 1500; Central Arizona, 3800; Chapparal, 23,100; Cherokee, 1400; Clarence, 4100; Consolidated Imperial, 2600; Crowell, 18,400; Dahlonega, 3100; Durango, 7000; Empire, 2300; Enterprise, 4900; Globe Copper, 20,400; Goodshaw, 1400; Granville, 1800; Hortense, 1600; Index, 300; Mariposa, preferred, 1750; common, 1250; Mexican, 760; Mineral Creek, 8700; Miner Boy, 25,200; North Standard, 2700; North State, 1000; Oriental & Miller, 24,300; Potosi, 200; Quartz Creek, 1300; Rappahannock, 7600; Red Elephant, 400; Silver Cliff, 8200; Silver Nugget, new, 31,100; South Bodie, 200; South Hite, 1600; South Pacific, 82,590; State Line, No. 1, 300; No. 4, 200; Nos. 1 and 4, 8600; Nos. 2 and 3, 159,570; Sutro Tunnel, 27,500; Taylor-Plumas, 24,500; Unadilla, 13,500; Union Consolidated, 820; Vandewater, 3300. Non-Dividend shares sold, 611,290. Total shares sold at all the Exchanges, 1,172,190.

Tin.—In large lines, practically nothing has been done, while the jobbing demand is reported fair on the basis of 25⅛@25¼c. for Straits, 25½c. for L. & F. and Billiton, and 28⅛@29c. for Banca. London cables £111 5s. for spot, and £118 5s. for

futures; Penang, $34½; and Singapore, $35, with exchange at 3s. 10d.

Mr. E. P. White has issued the following statistics:

NEW YORK, March 1, 1882.	Tons.	Tons.
Feb. 1st, 1782—Stock in all hands, New York, Boston, and Philadelphia		1,420
Imported during January, Straits and Malacca, into Boston	Nil.	
Imported during January, Straits and Malacca, into New York	125	
Imported during January, Australian, into New York	50	
Imported during January, L. & F., into New York	25	
Imported during January, Banca	10—	210
		1,630
Consumption—During February		650
Total spot stock		980
Afloat to date, Straits and Malacca, Dec., Jan., and Feb. shipments per steamers	1,695	
Afloat to date, Straits and Malacca, Dec., Jan., and Feb. shipments, sail	50—	1,745
Total in all hands, spot and afloat		2,725

Our latest mail advices from London, by Messrs. James & Shakespeare, are as follows, under date of the 17th ult.:

Only a moderate business took place, but prices were a shade firmer, opening at 110⅜s. sharp cash. Sales were made on second 'Change up to 111⅜s., closing, however, at 111⅛s., and rather sellers. Fourteen days went from 111@111⅜s.; three months at 112@112⅛s.

Shipments from the Straits for the past fortnight are reported as 450 tons for England, 250 tons for America.

Tin Plates have been dull under unfavorable advices from abroad, where cokes are quoted at 16s. We quote for large lines: Charcoal tin, Melyn grade, rates for ⅛ cross assortments, $6.50. Allaway grade, rates for ⅛ cross assortments, $6. Charcoal terne, Dean grade, 14 × 20, $5.45; 20 × 28, $11½; Allaway grade, IC, 14 × 20, $5.25@$5.30; Coke tin, Yspitty grade, IC, $5.37½@$5.62½; B. V. grade, IC, $5.15@$5.25. Coke terne, Glais grade, IC, 14 × 20, $5.12½.

Lead.—Though the consumption is reported very heavy, the wholesale business is on a small scale, probably chiefly owing to the fact that heavy transactions were made during the earlier part of the year. During the week, very little has been done, about 100 tons selling in jobbing lots at about 5·15c., which is still the figure asked. In St. Louis, there have been sales of 200 to 300 tons at 4·87½@4·90c. In refined, there has been no business whatever. It may be nominally quoted at 5·25c.

Spelter.—Apparently the advices from abroad have been weaker, and in sympathy therewith the market here, which is now virtually controlled by foreign metal, is lower. Our own domestic production has fallen off in consequence of the stoppage and failure of some works, and the West now absorbs most of its own spelter without sending any considerable quantities to this market, as it formerly did. Foreign spelter may be quoted here at 5⅝@5¾c., and Western nominally 5¼c. Sheet-zinc is quiet at 7½c.

Antimony.—Cookson's is selling at 15¼c., and Hallett's at 13¼c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 3.

The market both here and abroad is very quiet, and prices have a weak tendency, if not actually weaker. There appears to be a distrust of the future, without, however, any definite cause for it. The consumption is still as large as it has been, and consumers are only buying for present necessities through fear that the consumption will fall off and prices will recede. There are so many orders booked in all branches of the trade that no important decline is likely to take place soon. In the mean time, it is hoped by makers that confidence will again be restored, and that the trade will assume the position it lately held.

American Pig.—This branch of the trade is unquestionably quiet. Buyers are showing no anxiety, while makers, although not having lowered their prices, are more yielding. The orders on the books of makers are still very large, and good deliveries are making so that there is no accumulation of stocks. We quote No. 1 Foundry at $26@$27; No. 2 Foundry, $25; and Forge, $22@$23½.

Scotch Pig.—The business doing in this article is very unimportant. The arrivals of the past week were mostly sold in January and February. Unless the demand improves, importers will have to lower their prices or resort to storing. The Glasgow market is but little changed. Freights are down to 17s. 6d., although we learn that one of the Glasgow steamship lines has contracted to bring to this country 10,000 tons of potatoes at 30s. per ton. This is an evidence that there is but little chance for a further decline in iron freights. We quote Eglinton at $23½ from dock and $24 from yard; Glengarnock, from dock, $25; Gartsherrie, $26; Summerlee, $26; Coltness, $26¾@$27½.

Messrs. John E. Swan & Brothers, of Glasgow, under date of February 17th, report 106 furnaces in blast, as against 121 at the same time last year. The quantity of iron in Connal & Co.'s stores was 630,895 tons, a decrease of 260 tons for the week. The shipments show an increase of 3796 tons, as compared with the shipments to the same date in 1881. The imports of Middlesbrough pig-iron for the same period show an increase of 11,271 tons. The following were the quotations of the leading brands of No. 1 pig-iron: Gartsherrie, 58s. 6d.; Coltness, 59s.; Langloan, 60s.; Summerlee, 58s.; Carnbroe, 54s.; Glengarnock, 54s.; Eglinton, 49s. 6d. Middlesbrough pig-iron was quoted as follows, f. o. b.: No. 1 Foundry, 46s.; No. 2, 44s. 6d.; No. 3, 42s. 6d.; No. 4, 42s.; No 4 Forge, 41s. 6d.

Rails.—There is nothing doing in these. We quote steel rails in Pennsylvania at $55. Iron rails are quoted at $47 for foreign here, and domestic in Pennsylvania. It is estimated that the production of steel rails will amount to 1,270,000 tons this year, and that 1,200,000 tons have already been sold.

Old Rails.—Without business, we quote Ts at $29½ and D. Hs. at $31½.

Wrought Scrap.—From ship, we quote at $31½. No business has been reported during the week.

Philadelphia. March 3.

To-day's sales in pig-iron were large compared with the dullness of the past two weeks. There is more or less expectation of declining prices. Up to to-day, nothing positive has taken place to justify the hope. Buyers have kept out of the market, and have run stocks low. Some few men have taken alarm at the possibilities of an active spring trade overtaking a market bare of stocks, and have contracted for supplies two to four months ahead. Foreign makers are apparently determined to hold prices firmly, and there is nothing in the situation to warrant expectations of a collapse in prices. Consumers are able to buy iron as they require it in this market at satisfactory prices. Foreign stocks are not depleted except by handfuls. Foundry of good grade sold at $24.50 at furnace, No. 2 at $23, and Gray Forge $22. These are about inside prices. Lower prices have been offered. A few hundred tons of Bessemer went at $26, though $25@$25.50 is perhaps the best that could be had. Muck bars are weak at $45, and still lower prices are probable. Charcoal blooms are scarce and firm at $75; anthracite, $62@$64. Merchant iron is in active demand at 2·8c. nominally, at mill, to 3c. at store. There is no change in the condition or outlook. Manufacturers report as much business presented as they can get through with. Consumption has not fallen off at all, but the buyers have more faith in the capacity of mills to meet all requirements. Nails have not shown any activity beyond current wants; card, $3.40 net. Structural iron inquiries this week call for large lots. Quotations are a little more in favor of builders. No further weakening is probable. Angles are 3@3·2c.; Beams, 3·8@4c.; Channels, 4·1@4¼c. Mills are overcrowded. Plate and tank quiet, and the demand still limited to small orders. Consumers think the additions to capacity will be sufficient to enable manufacturers to meet all wants. Consumption is very heavy. Tank, 3½c.; Refined, 3¾c.; Shell, 4c.; Flange, 5@5½c.; Fire-Box, 6@6½c.

The negotiations in steel rails for the week developed no further decline in prices. Foreign rails at present ocean rates are not likely to come except under old purchases. For small lots, $57@$58 are named. Old rails are inactive because of high figures. Buyers offer $29@$29.50. Sellers want $30 for tees and $31.50 for doubles. Best scrap is selling at $34; medium, $30@32; crop ends, $27 asked; cast, $21; stove plate, $16; borings, $13.

COAL STOCKS.

NAME OF COMPANY.	Capital Stock.	Shares. No.	Shares. Par Val.	Last Dividend. Mo.	Y.	R't.	Rate per Ann.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted so much per share. Feb. 25. H.	L.	Feb. 27. H.	L.	Feb. 28. H.	L.	Mar. 1. H.	L.	Mar. 2. H.	L.	Mar. 3. H.	L.	Sales from Feb. 24th to Mar. 24 inclusive.
	$		$				Per c'nt													
Am. Coal Co.	1,500,000	60,000	25															30½	30	
Cameron C'l.	2,500,000	50,000	50																	
Col. C. & I.	10,000,000	100,000	10					41⅛	41	44	42	44¾	42¾					44	43½	4,122
Ches. & O. RR	15,000,000	150,000	100					21½		22	21½	22¼		21		21				1,970
Consol. Coal.	10,250,000	102,500	100	Jan.	82	2														
Cumb. C. & I.	560,000	5,000	100																	
Del. & H. C.	20,000,000	200,000	100	Sept	81	1½	6	‡		106¾	108¼	107¾	108¼	107⅝	107¾	106¾	107	106¾	107½	106¼	13,445
D., L. & W. RR	26,200,000	524,000	50	Dec.	81	2	8	‡		124	125⅝	124¾	126	124⅝	125¼	123¾	124⅛	123½	125	124	94,879
Lehigh C. & N	10,448,550	208,971	50	Nov.	81	3	5½	43		42¾	43		42⅞		43	42⅜					3,368
Leh. V'y R. R	27,042,900	540,858	50	Dec.	81	1½	6	62			62		62¼								164
Mary'd Coal	4,400,000	44,000	100		76	1½	1½	17													500
Montauk C'l.	2,500,000	25,000	100																		
Morris & Es'x	15,000,000	300,000	50	Jan.	82		7							123	122	122½	121			122½	122	490
New Cen. C'l	5,000,000	50,000	100	Dec.	81													18				100
N. J. C. RR.	20,600,000	206,000	100	Oct.	76	2½	2½	95		93⅜	96	94¼	97	95	95	91	93	90½	93	91¾	64,775
Penn. Coal	5,000,000	100,000	50																		
Penn. R. R.	68,870,200	1,337,404	50	Nov.	81	4		60¾	60⅛	60⅛	60⅛	60⅜	60⅛	60⅜	60⅜						35,551
Ph. & R. RR*	34,278,150	685,563	50	Jan.	76	2¼	10	59¾	58⅜	59½	59	60⅜	59	59⅜	57¾	59	57⅞	59⅛	58⅜	75,701
Spring Mt. C'l	1,500,000	30,000	50	Dec.	81	3½	7														

Total sales ..... 295,005.

†107¾. ‡124⅛. *Of the sales of this stock, 35,551 shares were in Philadelphia and 40,150 in New York.

We publish the following letters from our regular correspondents:

Baltimore. Feb. 28.

[Specially reported by R. C. HOFFMAN & Co.]

The iron market continues very quiet, with heavy consumption, and prices without material change. We quote:

Balt. Char.	$36.00@$38.00	Anth. No. 3.	$21.00@$23.00
Va. "	36.00@ 38.00	Mot. and Wh.	20.00@ 21.00
Anth. No. 1.	26.00@ 27.00	Cl. C. B. Bl'om	70.00@ 75.00
" " 2.	24.00@ 25.00	Refined Bl'm.	60.00@ 65.00

Louisville. Feb. 28.

[Specially reported by GEORGE H. HULL & Co.]

The pig-iron market continues very quiet, furnaces being sold several months in advance, and behind in their deliveries on contracts. There is no hot-blast iron pressing on the market for sale. On the other hand, there is little or no inquiry. In the absence of sales, it is difficult to quote the market, but for delivery for the last half of the year, iron could probably be bought 5'c.@$1 per ton below prices current first of this month. We therefore revise our quotations in accordance with this condition. If there should be any demand for mill irons for immediate delivery, it would probably bring 50c.@1 per ton more than our quotation. There is no demand for car-wheel irons. Quotations for this grade are therefore nominal.

FOUNDRY IRONS.

	No. 1.	No. 2.
Hanging Rock Charcoal	$30.00@	.....@ .....
Southern Charcoal	27.00@$28.00	.....@ .....
H'n g Rock, Stc'l & Coke	27.00@ 27.50	.....@ .....
Southern Stonecoal & Coke	26.50@ 27.00	$25.00@$25.50

Amer. Scotch	$25 @$26	Op'n Silv'r Gray	$24½@$25
Cl'se Silver Gray	23 @ 24		

MILL IRONS.

No. 1 Charcoal	$25.00@$25.50
No. 1 Stonecoal and Coke, neutral	24.00@$24.50
No. 2 Stonecoal and Coke, neutral	23.00@ 23.50
No. 1 Stonecoal and Coke, cold-short	23.00@ 24.00
No. 2 Stonecoal and Coke, cold-short	22.50@ 23.00
White & Mottled, cold-short and neutral	21.00@ 22.00

CAR-WHEEL AND MALLEABLE IRONS.

Hanging Rock, cold blast	$36.00@$38.00
Hanging Rock, warm blast	30.00@ 32.00
Alabama and Georgia, warm and cold blast	34.00@ 37.00
Central Kentucky, cold blast	34.00@ 36.00

Milwaukee. Feb. 27.

[Specially reported by R. P. ELMORE & Co.]

The demand is good and the supply is light. There are no Superior irons on hand of any kind. The Lake Superior furnaces are almost all sold up to the opening of navigation.

	F. o. b. here.
Lake Superior, No. 1	$30.00
" " " 2	30.00
" " " 3	33.00
" " " 4, 5, 6	34.00
Silvery (Ohio), " 1	25.00
Summerlee (imp. Scotch)	31.00
Glengarnock " "	30.00

Richmond. Feb. 28.

[Specially reported by ASA SNYDER.]

The market is steady, without change in prices since last report.

Scotch Pig-Iron		$26.00@$29.50
Anthracite Pig-Iron	No. 1	27.00@ 29.00
" "	No. 2	24.00@ 25.50
" "	No. 3	@ 23.50
Virginia Coke Pig-Iron,	No. 1	25.00@
" "	No. 2	22.50@ 23.50
" "	No. 3	20.00@ 23.00
Va. Charcoal C. B. Wheel Iron		34.00@ 36.00
Old Rails		29.00@ 31.00
Wrought Scrap No. 1		26.00@ 28.00
Cast Machinery Scrap		20.00@ 21.00
Richmond Refined Bar-Iron		3@3 1-10
Horse-Shoes (Tredegar)		@ 4.00
Mule " "		@ 5.00

St. Louis. Feb. 28.

[Specially reported by HOFFER, PLUMB & CO.]

This market is still very quiet, no business of any importance being done. We continue quotations of last week:

HOT BLAST CHARCOAL.	
Missouri	$27.00@
Southern	30.00@ 31.00
Ohio	27.00@$29.00
COKE AND COAL.	
Missouri	None offering.
Southern	$27.00@$29.00
Ohio	27.00@ 29.00
MILL IRONS.	
Red short	$26.00@
Neutral	25.00@ 26.00
CAR-WHEEL AND MALLEABLE IRONS.	
Missouri	$28.00@$35.00
Southern	35.00@ 37.00
Ohio	32.00@ 40.00
IRON ORE.	
Southwest red hematite	$7.00@
Iron Mont ordinaries	8.00@
Fix ores	10.00@

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 3.

Anthracite.

There is but a very small demand for coal, and prices are fully as low as they have been. Stocks are not heavy in any portion of the country, and the outlook for a good year's business is still very encouraging. In the East, stocks with many manufacturers are low. With some, however, they are very liberal. The latter are mostly those who depend largely upon water-power, of which they have had an abundance this winter, while last winter it was very poor.

The managers of the coal companies have been attempting to make some arrangement for curtailing production this month, but have not yet arrived at an understanding. The probabilities are, that it will be agreed before next Wednesday to stop running for nine days during the remainder of the month—that is, to work but three days per week during the next three weeks.

It is said by good authority that the miners in the Wyoming field are likely to demand an advance of 20 per cent in their wages about April 1st or May 1st. If such should prove true, the demand will be opposed by the companies.

Vessels are in good supply and freights easy.

Our Philadelphia correspondent, under date of March 2d, says:

The stock at Port Richmond is decreasing rapidly, and free stove and chestnut are entirely cleaned out. This is owing principally to a number of collieries, particularly free-burning, being drowned out. Seventeen of the Coal and Iron Company's collieries were idle to-day from that cause. The mild weather affects, of course, the family trade, but the curtailment due to high water compensates for it, and there is a good demand for all the good white ash coal produced. Red ash is still dull.

Eastern orders are beginning to come. Freights are unsettled. Vessels are scarce, and the readiness of bituminous coal shippers to pay full rates has rendered it impossible to get vessels at rates published a short time ago. To Boston, $1.65@$1.75 is asked for good-sized vessels. To Southern ports, vessels being plenty and orders scarce, there has been a marked decline—90c. to Richmond; 70@75c. to Norfolk.

It is not yet admitted here that the programme published of half-work for balance of March after this week is a fixed fact, and the matter is still undecided.

Bituminous.

There is a very fair demand for this coal, owing largely to the prospects of greatly reduced supplies. Alongside for coal afloat $5 is asked, while for future supplies $5.10@$5.15 is asked. It is now stated that the producers of Cumberland coal will demand a reduction of 15c. per ton on mining on the 15th inst. It is almost certain that the men will not submit to it, and that a strike will ensue. If so, it is probable that the supply from this field will be cut off for a month or six weeks. We are confident, however, that in this movement the companies are determined to win, and we see no reason why they should not. It is said that the Baltimore & Ohio Railroad and the Pennsylvania Railroad have entered into an arrangement to advance freights 50c. per ton, dating the arrangement from March 1st. The outlook is certainly very strong in favor of an advance in the price of bituminous coal very soon.

Buffalo. March 1.

[Specially reported by Messrs. LEE & LOOMIS.]

At the Grand Trunk letting it is understood the awards were to:

	Tons.
Hamilton Coal Co.	30,000
Daguscohonda coal	50,000
Pittsburg Coal and Mining Co	40,000
P. Burns (for Toronto)	10,000
	130,000

The price, though not public, is thought to be from $2.70 to $2.80 per ton at the International bridge.

Chicago. Feb. 27.

[Specially reported by Messrs. RENO & LITTLE.]

The month of February now drawing to a close has been quite too mild for the good of the coal trade. The supply of all kinds of coal in this market is far in excess of the demand, and in consequence of this excess and the urgency (fancied or otherwise) of some dealers to realize, there are no regular prices at retail for the present. We quote:

Broken and Egg	$7.25	Wilmington and Ill.	$4.50
Stove and Nut	7.50	Indiana	$4.00@ 5.00
Brier Hill and Erie	6.50		

Milwaukee. March 1.

[Specially reported by Messrs. R. P. ELMORE & CO.]

The supply of coal on hand here is no doubt sufficient to last until the opening of navigation. The demand has been light for some time past, and is now, owing to the extremely mild weather. We give you below quotations on coal as follows:

	Per net ton.		Per net ton.
Blossburg	$6.00	Brier Hill (grate)	$7.00
Cumberland	6.00	Straitsville (steam)	
Lehigh lump	9.50		$5.50@ 6.00
Prepared—all sizes	8.50	Illinois (steam)	3.50

Retail, cash on delivery.

STATISTICS OF COAL PRODUCTION.

Comparative statement of the production of anthracite coal for the week ended Feb. 25th, and years from January 1st:

TONS OF 2240 LBS.	1882. Week.	1882. Year.	1881. Week.	1881. Year.
Wyoming Region.				
D. & H. Canal Co.	45,113	418,473	84,528	511,421
D. L. & W. RR. Co.	59,412	529,460	96,877	601,435
Penn. Coal Co.	11,046	122,601	27,914	156,646
L. V. RR. Co.	14,723	140,207	20,728	154,632
P. & N. Y. RR. Co.	2,961	24,120	719	5,788
C. RR. of N. J.	*	253,394		273,857
	133,255	1,488,255	230,766	1,701,779
Lehigh Region.				
L. V. RR. Co.	59,362	514,678	95,383	606,402
C. RR. of N. J.	*	215,513		218,044
S. H. & W. B. RR.		1,223		676
	59,362	731,414	95,383	825,122
Schuylkill Region.				
P. & R. RR. Co.	66,860	725,060	125,411	805,494
Shamokin & Lykens Val.	16,113	167,145	17,898	153,633
	82,973	892,205	143,309	959,127
Sullivan Region.				
St Line&Sul.RR.Co.	1,175	7,449	1,350	9,460
Total	276,765	3,119,323	470,808	3,495,488
Increase				
Decrease	194,043	376,165		

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

* This report has not yet been received.

Total same time in 1877	2,279,210 tons.
" " " " 1878	2,026,446 "
" " " " 1879	2,956,412 "
" " " " 1880	2,921,937 "

The increase in shipments of Cumberland Coal over the Cumberland Branch and Cumberland & Pennsylvania railroads amounts to 68,396 tons, as compared with the corresponding period in 1881.

The shipments of Cumberland Coal, over the George's Creek & Cumberland RR., by the Maryland and the American Coal companies, for the week ended Feb. 18th, amounted to 3721 tons, and for the year from Jan. 1st, 26,768 tons.

Belvidere-Delaware Railroad Report for the week ended Feb. 25th:

	Week.	Year. 1882.	Year. 1881.
Coal for shipment at Coal Port (Trenton)			
Coal for shipment at South Amboy	9,865	96,684	76,208
Coal for distribution	10,171	93,515	135,976
Coal for company's use	2,854	21,012	18,043

The Transportation of Coke over the Pennsylvania Railroad for the week ended Feb. 18th, and year from Jan. 1st:

Tons of 2000 lbs.	Week.	Year.
Penn. RR. (Alleghany Region)	2,380	15,061
West Penn. RR.	4,766	22,249
Southwest Penn. RR	34,583	250,186
Penn. & Westmoreland Region, Pa. RR	4,808	39,776
Pittsburg, Penn. RR	14,818	80,548
Show Shoe (Clearfield Region)	661	4,141
Total	62,016	411,961

The Production of Bituminous Coal for the week ended Feb. 18th was as follows:

Tons of 2000 lbs., unless otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2240 lbs	41,606	273,753
Barclay Region, Pa.		
Barclay RR., tons of 2240 lbs.	9,023	56,666
Broad Top Region, Pa.		
Huntingdon & Broad Top RR.	4,955	31,394
East Broad Top	2,593	15,132
Clearfield Region, Pa.		
Snow Shoe	4,740	21,205
Tyrone and Clearfield	49,421	317,013
Alleghany Region, Pa.		
Pennsylvania RR.	10,747	65,435
Pittsburg Region Pa.		
West Penn RR	7,235	47,192
Southwest Penn. RR.	455	3,748
Penn & Westmoreland gas-coal, Pa. RR	25,671	182,596
Pennsylvania RR.	12,840	93,709

FREIGHTS.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actual charters to March 3d, 1882.

Harbor freights are 15 cents from Hoboken and 18 cents from Amboy.

PORTS.	From Philadelphia.	From Baltimore.	From Elizabethport, Port Johnston, South Amboy, Hoboken, and Weehawken.
Alexandria		.75	1.00
Allyn's Point			
Annapolis		.80	1.00
Albany			.50@.55
Baltimore			1.00
Bangor		2.00	1.55@1.60
Bath, Me.		1.90	1.15*
Beverly		1.90	1.45@1.50
Boston, Mass.	1.65@1.70	1.90	1.35@1.50
Bristol	1.35	1.80	1.00
Bridgeport, Conn.	1.35	1.70	.50@.55
Brooklyn		1.60	18§ 15H
Cambridge, Mass.		1.90	1.35@1.50
Camoridgeport	1.75 and 3c.	2.20	1.35@1.50
Charleston		1.00	1.50
Charlestown	1.70	1.90	1.35@1.50
Chelsea	1.65	1.90	1.35@1.50
City Point		1.00	1.00
Com. Pt., Mass.	1.75		1.50
E. Boston	1.65@1.75	1.90	1.35@1.50
East Cambridge		1.90	1.35@1.50
E. Gr'nwich, R. I.			1.00
Fall River	1.35	1.75	.90@1 00
Galveston		3.60	
Georgetown, D.C.			1.00
Gloucester	1.75	2.00	1.50
Hartford			1.00@1.10
Hackensack			.25§
Hudson			.50@.55
Lynn	2.00	1.90@2.00	1.45@1.60
Marblehead		2.00	1.35@1.50
Medford			
Millville			
Milton		1.75	
Newark, N. J.		1.70	.25§
New Bedford	1.35	1.70	1.05@1.10
Newburyport		2.00	1.50@1.65
New Haven		1.70	.50@.55
New London	1.35	1.70	.70@.80
Newbern		2.00	1.25
Newport	1.40	2.00	.67@.70
New York		1.60	18§ 15H
Norfolk, Va		.90	1.00
Norwich			.70@.85
Norwalk, Conn			.55
Pawtucket	1.45¶		1.10¶
Philadelphia			.90
Portland		1.90	1.15*
Portsmouth, Va.		.90	1.65
Portsmouth, N.H.	1.80@1.85	2.00	1.45@1.65
Providence	1.35	1.75	1.00@1.05
Quincy Point		2.00	1.40@1.60
Richmond, Va.		1.25	1.15
Rockland			1.35@1.50
Rockport			1.55@1.65
Roxbury		2.00	1.55@1.65
Saco			1.25@1.35†
Sag Harbor			1.05@1.10
Salem, Mass.		2.00	1.40@1.50
Saugus			1.60@1.75
Savannah		1.10	1.50
Somerset	1.35	1.75	.90@1.05
Staten Island			.18§
Trenton			
Troy			.50
Wareham	1.70@1.75		1.25
Washington			
Weymouth		2.10	1.40¶
Williamsbg, N.Y.			18§ 15H
Wilmington, Del.		.75	.90
Wilmington, N.C.		1.25	1.50

* And discharging. † And discharging and towing. ‡3c. per bridge extra. § Alongside. ‖ And towing up and down. ¶ And towing. ** Below bridge. H Hoboken.

Horsford's Acid Phosphate,

Brain Tonic.

Horsford's Acid Phosphate is cordially recommended by E. W. Robertson, M.D., of Cleveland, as a brain and nerve tonic, especially in nervous debility.